PinPoint X HSDPA

for AT&T

User Guide

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SIERRA WIRELESS
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Due to the nature of wireless communications, transmission and reception of data can never be guaranteed. Data may be delayed, corrupted (i.e., have errors) or be totally lost. Although significant delays or losses of data are rare when wireless devices such as the Sierra Wireless AirLink PinPoint X are used in a normal manner with a well-constructed network, the Sierra Wireless AirLink PinPoint X should not be used in situations where failure to transmit or receive data could result in damage of any kind to the user or any other party, including but not limited to personal injury, death, or loss of property. Sierra Wireless accepts no responsibility for damages of any kind resulting from delays or errors in data transmitted or received using the Sierra Wireless AirLink PinPoint X, or for failure of the Sierra Wireless AirLink PinPoint X to transmit or receive such data.

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5,890,057	5,929,815	6,169,884	6,191,741	6,199,168
6,339,405	6,359,591	6,400,336	6,516,204	6,561,851
6,643,501	6,653,979	6,697,030	6,785,830	6,845,249
6,847,830	6,876,697	6,879,585	6,886,049	6,968,171
6,985,757	7,023,878	7,053,843	7,106,569	7,145,267
7,200,512	D442,170	D459,303		

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Consult our website for up-to-date product descriptions, documentation, application notes, firmware upgrades, trouble-shooting tips, and press releases:

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Revision History

Revision number	Release date	Changes
1.x	2003-2005	AirLink Communications documentation - CDPD, CDMA, and GPRS.
2.x	Q2: 2005-Q2: 2007	AirLink Communications documentation - CDMA, EV-DO, EDGE, and HSDPA.
3.0	in draft	Converted documentation from AirLink Communications documentation format into Sierra Wireless documentation format. Phase II of the conversion completed. PinPoint modem line documentation is revised.

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1: Introduction to the PinPoint X

1

- ALEOS™
- AceWare™
- Connecting to the AT&T Network
- HSDPA Communication

The PinPoint X is a compact, intelligent and fully-featured mobile communications platform with multiple peripheral connections including serial, Ethernet and USB. Expanded I/O functionality in a separate connector includes four digital inputs, four analog inputs and two relay outputs unleashing extensive remote instrumentation possibilities.

Its high-precision 16-channel GPS receiver coupled with the rich embedded intelligence provided by ALEOS™ technology make PinPoint X the perfect choice for a broad set of mobile enterprise, public safety, fleet management and AVL solutions.

Figure 1-1: Sierra Wireless AirLink PinPoint X

ALEOS™

ALEOS, the embedded core technology of the Sierra Wireless AirLink products simplifies installation, operation and maintenance of any solution, and provides an always-on, always-aware intelligent connection for mission-critical applications. ALEOS enables:

- Persistent Network Connectivity
- Over-The-Air (OTA) Upgrades
- Wireless Optimized TCP/IP
- Real-Time Notification

- Real-Time GPS Reporting
- GPS Store and Forward
- Packet Level Diagnostics
- Device Management & Control
- Protocol Spoofing

Figure 1-2: Powered by ALEOS

AceWare™

A wireless solution is not complete until you have software tools to manage the devices monitoring your valuable equipment. AceWare™ is the device management and monitoring application suite for Sierra Wireless AirLink products powered by ALEOS.

- AceManager
- AceNet
- AceView
- Modem Doctor

These modem utilities, except AceNet, are free of charge to those who own Sierra Wireless AirLink modems. You can download the applications and their user guides from the Sierra Wireless AirLink Solutions web site: http://www.sierrawireless.com/support. Contact your dealer or Sierra Wireless representative for information on AceNet.

Note: AceView, AceManager, and AceNet require the Microsoft .NET Framework v. 1.1 and Microsoft Windows 98, Windows 2000, Windows XP, or later. You can obtain the Microsoft .NET Framework from Microsoft at: http://www.microsoft.com/.

AceManager

AceManager, the AceWare remote configuration and monitoring tool, simplifies deployment and provides extensive monitoring, control and management capabilities. AceManager gives you the power to monitor and control your Sierra Wireless AirLink communications platforms in real-time.

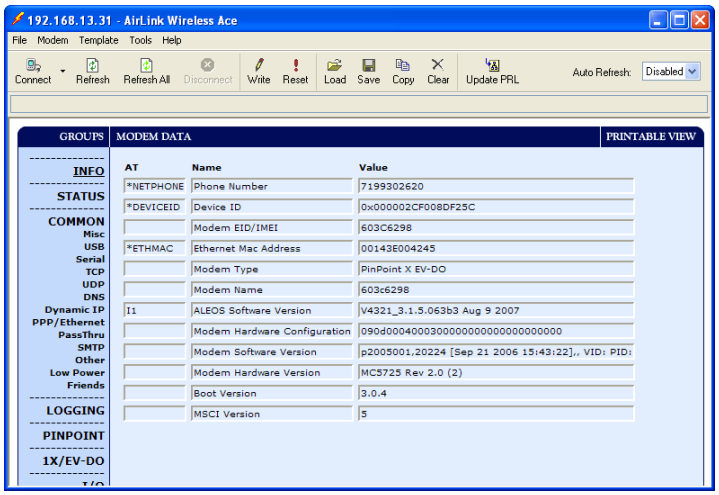


Figure 1-3: AceManager

Simplified Deployment

AceManger provides the ability to remotely set up and configure your Sierra Wireless AirLink products. Remote device setup and configuration reduces the deployment timeline of your wireless solution and provides a quicker path to ROI.

Templates allow you to easily configure other devices in your fleet with identical settings, ensuring a simple, accurate deployment.

Monitor and Control

AceManger allows an administrator to remotely monitor a modem's status, health and configuration settings. The user interface displays signal strength, cell site information, byte counters and error conditions, enabling you to pinpoint any issues and troubleshoot immediately.

AceManager enables remote configuration and parameter settings to be changed or reset instantly over the air, change a device's port configuration, IP address settings, GPS settings, and much more. After configuring one modem, use the template feature to copy that device configuration to other modems.

Tip: *Configuration steps and examples in this guide use AceManager.*

AceNet

AceNet, the enterprise grade productivity enhancing tool, enables you to efficiently deploy and monitor Sierra Wireless AirLink products on a large scale.

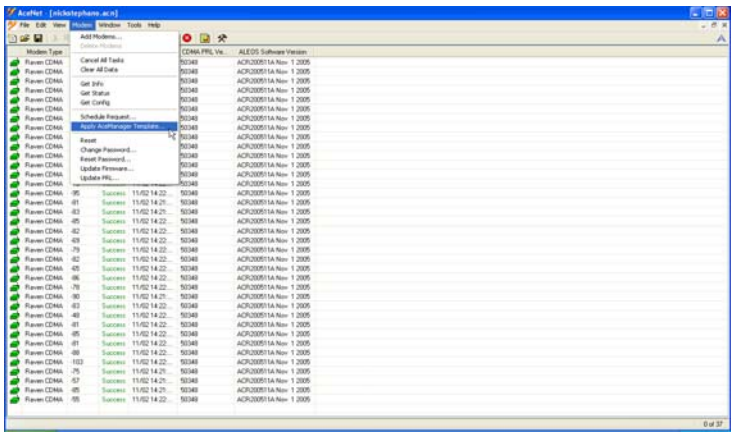


Figure 1-4: AceNet

Network Monitoring

AceNet allows you to efficiently deploy, monitor, and maintain wireless networks of any size by enabling you to quickly configure an entire group of Sierra Wireless AirLink modems to the same parameter settings using templates built with AceManger.

To ensure your implementation is optimal, users can easily see when modems are out of contact and periodically poll each device for performance statistics.

AceView

AceView is an efficient status and connection monitoring application with a low-profile, easy to read interface.

Figure 1-5: AceView

Modem Doctor

Modem Doctor is a troubleshooting and diagnostics utility. This utility will allow you to get a log file of the PinPoint X activity which you can then send to Sierra Wireless support, erase the current configuration completely., and temporarily set the PinPoint X to a known configuration to aid in trouble shooting (SOS mode).

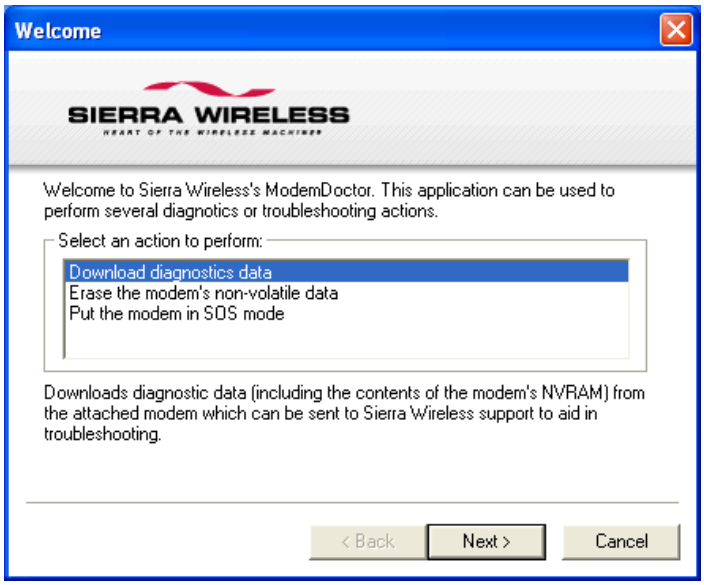


Figure 1-6: Modem Doctor

Modem Doctor USB

1. Open the ModemDoctorUSB.exe.
2. Select any one option.

Note: If you are using USB port as serial, then USB device is set to "o" and if you are using the default option then the USB device is set to "1".

The available port is automatically detected. Passsword is the fault password.

3. Press Erase. The modem will then reset.

Note: If you erase the fatory defaults will be restored. USBnet is the factory default port.

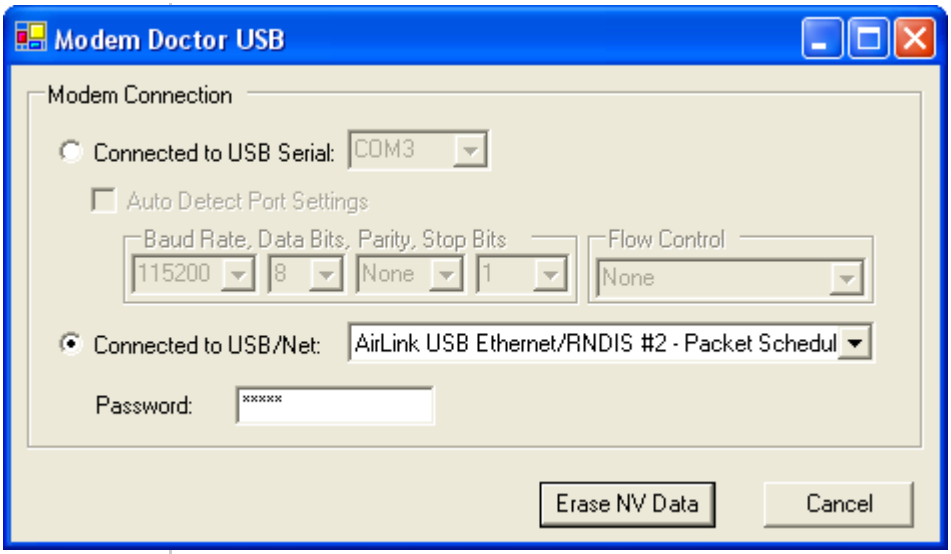


Figure 1-7: Modem Doctor: USB connection

Connecting to the AT&T Network

The PinPoint X uses AT&T as an ISP (Internet Service Provider) to connect you to the Internet.

Steps of a connection:

1. When your PinPoint X is powered on, it automatically searches for cellular service using HSDPA or EDGE.
2. Your PinPoint X establishes a PPP (Point to Point Protocol or "dial" up connection) link to the AT&T network, also called registering on the network, and receives an IP address.
3. When your PinPoint X has received its IP address from AT&T, a connection to the Internet or the cellular network is also available for a computer or other device connected directly to the PinPoint X.

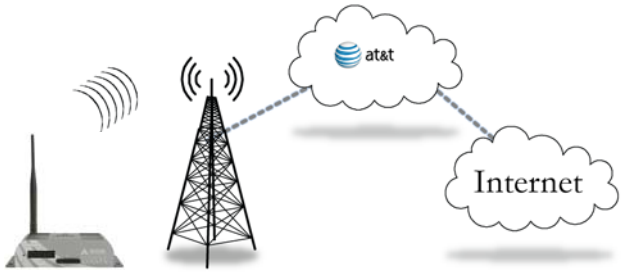


Figure 1-8: Connecting to the Internet

The PinPoint X will perform a ***one-to-one*** routing for all internet traffic to and from the computer or other end device. One-to-one means that your PinPoint X will provide a connection for one device to the Internet at a time. In Private Mode, the PinPoint X will provide NAT (Network Address Translation) for the computer or other end device.

Note: The PinPoint X does not provide advanced routing required by one-to-many (several devices connected to one port). If you need to have more than one device connected to the Internet through your PinPoint X, you will need to have a router connected to the modem. The modem would provide the one-to-one connection to the router with the router configured to provide a broader NAT service to the other devices connected to it.

Dynamic vs. Static IP Addresses

There are two types of addresses on networks: dynamic and static.

- Dynamic addresses are assigned on a "need to have" basis. Your PinPoint X might not always receive the same address each time it connects with AT&T.
- Static addresses are permanently assigned to a particular account and will always be used whenever your PinPoint X connects to the Internet. The IP address will not be given to anyone else.

Most ISPs (cellular included) use dynamic IP addresses rather than static IP addresses since it allows them to reuse a smaller number of IP addresses for a large number of customers. A dynamic IP address is suitable for many common Internet uses, such as web browsing, looking up data on another computer system, or other client functions (such as data only being sent out or only being received after an initial request).

Tip: *If your account with AT&T includes a dynamic IP address and you need a static IP, please consult your AT&T Representative for more information about changing your account for static IP support.*

If you need to contact your PinPoint X, a device connected to the PinPoint X, or a host system using the PinPoint X from the Internet, you need to have a known IP (such as one which is static) or domain name (an IP address which is converted by a DNS server into a word based name). If you have a dynamic IP

address for your modem, you can use a Dynamic DNS service (such as IP Manager) to translate your IP address into to a domain name.

Caution: *If you want to connect remotely to your PinPoint X using TCP/IP, the IP address given to your modem by AT&T cannot be a private or internal IP address (such as a custom APN) unless you are on the same network or inside that network's firewall (such as with frame relay).*

HSDPA Communication

Many of the GSM Networks have been expanded to the faster and more robust HSDPA and UMTS. While HSDPA and UMTS are a departure from the GPRS architecture and use a different method of connectivity, to provide more seamless service, the carriers employing these more advanced technologies are retaining backward compatibility to EDGE and GPRS.

GSM Networks use SIM cards which are smart cards containing the account holder's details. A SIM can generally be moved from one device to another allowing for account portability and flexibility.

HSDPA

HSDPA (High-Speed Downlink Packet Access) is a cellular technology allowing for higher data transfer speeds, up to 14.4 Mbit/s per cell in the downlink and 2 Mbit/s per cell in the uplink. HSDPA uses Adaptive Modulation and Coding (AMC), fast packet scheduling at the Node B (Base Station) and fast retransmissions from Node B (known as HARQ-Hybrid Automatic Repeat Request) to deliver the improved downlink performance vs. UMTS and EDGE.

HSPDA (and HSUPA in the future) falls back to UMTS, EDGE or GPRS (in order of precedence). This feature allows you to have seamless connectivity no matter where your PinPoint X is.

UMTS

UMTS (Universal Mobile Telecommunications System) supports up to 1920 kbit/s data transfer rates, although most users can expect performance up to 384 kbit/s. A UMTS network uses a pair of 5 MHz channels, one in the 1900 MHz range for uplink and one in the 2100 MHz range for downlink.

EDGE

EDGE (Enhanced Data rates for GSM Evolution) provides end-to-end packet data services with an enhanced connectivity building on GPRS technology and using the established GSM networks. EDGE provides higher transmission rates and better transmission quality for data than GPRS. EDGE can carry data at speeds typically up to 384 kbit/s in packet mode.

GPRS

General Packet Radio Service (GPRS) is packet-switched with many users sharing the same transmission channel, but only transmitting when they have data to send. This means that the total available bandwidth can be immediately dedicated to those users who are actually sending at any given moment, providing higher utilization where users only send or receive data intermittently. GPRS provides speeds of 30–70 kbps with bursts up to 170 kbps.

2: Specifications

- Interface Port Pin-Outs
- Power Connector

Features and Benefits

- Embedded Intelligence
- Low Power Consumption
- High-Speed Processor
- High-Speed 2-way Data
- Multiple Interfaces, I/O Port
- High-Sensitivity GPS Receiver
- Persistent Network Connectivity
- Remote Management and Configuration
- Extensive Vehicle Telemetry
- Integrated with 3rd Party Tracking Applications
- Rugged for Extreme Environments

Technology

- HSDPA

  With Fallback to:
  - UMTS
  - GSM EDGE
  - GPRS (MS-12)

Bands

- Dual Band UMTS/HSDPA
  - 850 MHz and 1900 MHz
- Quad Band GPRS/EDGE
  - 850 MHz, 900 MHz, 1800 MHz and 1900 MHz

Environmental

- Operating Temperature:
  - -30 to 70° Celsius
- Storage Temperature:
  - -40 to 85° Celsius

Power Consumption: (@12V DC)

- Transmit/Receive (Typical/Max) 382/414 mA
- Idle 186 mA
- Idle 166 mA
- Low Power Mode 54 mA

- Input Voltage 9 - 28V DC

Standards/Approvals

- Carrier specific approvals
- FCC
- Industry Canada

Host Interfaces

- Ethernet: 10/100 Mbps RJ-45
- USB Type B
- RS-232: DB9 DCE (300-230400 baud)
- I/O: 4 Digital, 4 Analog, 2 Relay
- Antenna Connection:
  - Cellular - 50 Ohm TNC
  - GPS - 50 Ohm SMA

Dimensions

- 135mm x 38mm x 91mm
- 612 grams

Application Interfaces

- TCP/IP, UDP/IP, DHCP, HTTP, SNMP, SMTP, SMS, MSCI, NMEA, TAIP, GPS, and more

LED Indicators

- Network
- Signal
- Activity
- Service
- GPS
- Power

Interface Port Pin-Outs

Serial Port

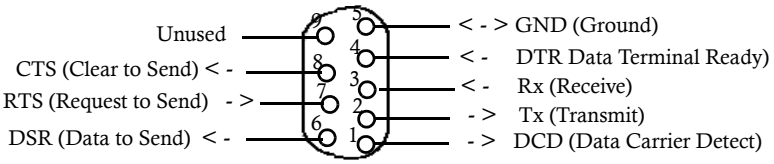


Figure 2-1: Serial Port Diagram: Female DB-9 DCE (not to scale)

I/O Port

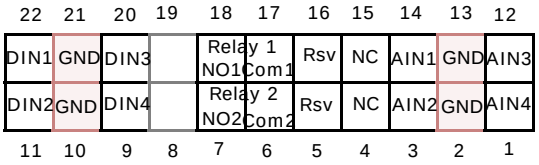


Figure 2-2: PinPoint X I/O Port Diagram (not to scale)

Table 2-1: PinPoint X I/O Port Pin-out

1. Analog Input 4	**12.** Analog Input 3
2. Analog Ground	**13.** Analog Ground
3. Analog Input 2	**14.** Analog Input 1
4. No Connect	**15.** No Connect
5. Reserved for future use	**16.** Reserved for future use
6. Com2 (for use with #7)	**17.** Com1 (for use with #18)
7. Normal Open Relay	**18.** Normal Open Relay
8. None	**19.** None
9. Digital Input 4	**20.** Digital Input 3
10. Ground	**21.** Ground
11. Digital Input 2	**22.** Digital Input 1

Power Connector

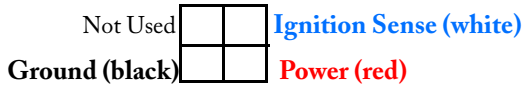


Figure 2-3: Power Connector (not to scale)

3: Activating PinPoint X on AT&T Network

3

- Installating the SIM
- Configuring the APN

This chapter provides step-by-step directions for activating your PinPoint X on the AT&T cellular network.

Installating the SIM

The SIM in the PinPoint X is a smartcard securely storing the key identifying a cellular subscriber. Generally, you will only need to install a SIM once in the life of the modem and it may be pre-installed by your Sierra Wireless Representative.

1. Before you start

If the SIM was pre-installed, unless you need to set a custom APN, activation of your modem is complete.

Cellular Account Required

- **Cellular account** - To use your modem you need to have a SIM (Subscriber Identity Module) with an active account with an HSDPA cellular provider (such as AT&T).

Software Required

- **AceManager** - Graphical interface for entering most AT Commands. You can download AceManager from the Sierra Wireless AirLink Solutions website: http://www.airlink.com/support/. A default installation of this utility is assumed later in these directions

Hardware Required

- **Ethernet cable or serial cable** - An Ethernet cable or straight through serial cable.

Note: Until you install a driver for the USB port, you cannot use your USB port to configure the modem.

- **Power adapter and a power source** - You will need a power supply and power source for the modem.
- **PC or Laptop** - To configure the modem, you will need a computer with an available Ethernet port or serial port.

Tools Required

- **Small Phillips screw driver** - The Phillips screw driver is the one which is also called a plus (+) or X screw driver.
- **Slim stylus** - A PDA stylus, an unbent paperclip, or other such item.

2. Opening the SIM Slot

a. Unplug the PinPoint X power and all cables.

b. Remove slot cover on the front of the PinPoint X to reveal the SIM slot.

Figure 3-1: Slot Cover

3.

a. Carefully remove the SIM card from the card you got from AT&T.

4. Ejecting the SIM tray

Figure 3-2: SIM tray button

5. Insert the SIM into the Tray

a. Remove the SIM from the card you obtained from your AT&T.

Note: The card and SIM may be a different color than these examples.

Figure 3-3: Sample of a Card with SIM

Figure 3-4: Insert SIM in to the modem

b. Place the SIM into the tray and gently press to click it into place.

Figure 3-5: Empty SIM Tray and a Tray with a Sample SIM

6. Insert the Tray and SIM

a. Slide the tray back into the modem.

b. Gently press to click it into place.

Tip: *The top of the card faces the bottom of the modem.*

Figure 3-6: Inserting the SIM

7. Finishing the SIM installation

Replace the cover to prevent dust or other unwanted particles from entering the PinPoint X. Once the cover is replaced, the installation is complete.

Note: The first time you power on your Raven-E with your new SIM, there may be a delay of up to 10 minutes for the initial network connection to occur.

Configuring the APN

The APN (Access Point Name) is the way your modem knows how it will be communicating with the network. The APN allows custom IP addressing and tailoring your company's wireless IP solution to meet the security and IP addressing requirements of your applications.

Note: Most accounts use the default addressing solution of Private or Public IP addresses supplied by the Internet and Proxy APNs. Only if you have a Static or Custom IP address should you need to configure a custom APNs.

The default APN is *Internet*. If you need a different APN, use can use AceManager to configure it.

1. Start AceManager

Start > All Programs > AirLink Communications > AceManager 3G > AceManager 3G

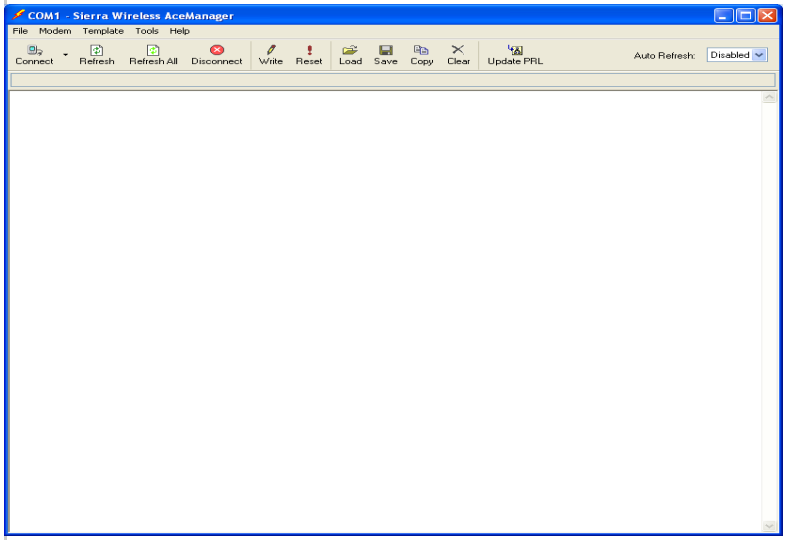
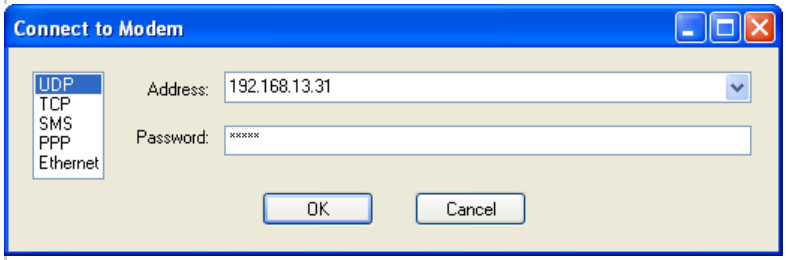


Figure 3-7: AceManager

2. Connect to the Modem

a. Click the Connect button.



b. Select a connection method:

- If you are connecting locally with the modem connected directly to your computer using a serial cable, you can use PPP.
- If you are connecting locally with the modem connected directly to your computer using an Ethernet cable, you can use UDP, TCP, or Ethernet.

c. Enter the connection information.

- For UDP or TCP, enter 192.168.13.31 as the IP address.
- For PPP, select the COM port to which the modem is connected.

d. Enter the password. The default password will be entered for you.

e. Select *OK*.

3. Enter the APN

a. Select *EDGE/HSDPA* from the menu on the left side of AceManager (under "Groups")

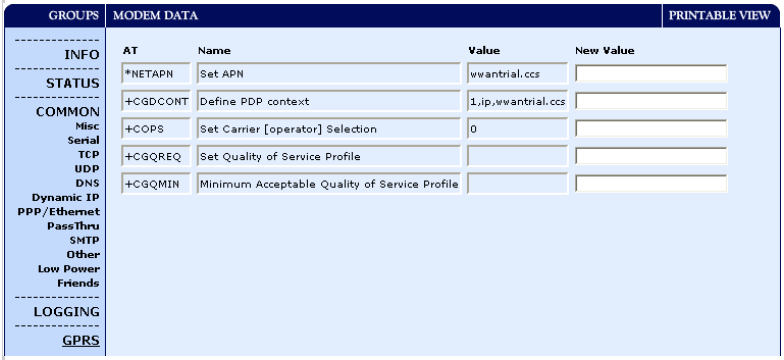


Figure 3-8: AceManager : EDGE/HSDPA

b. Type your APN in the New Value field of ***NETAPN**.

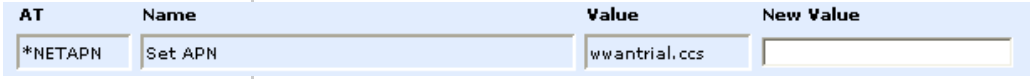


*Figure 3-9: AceManager : EDGE/HSDPA - *NETAPN*

Optional: If you need to configure your modem for a custom APN, after entering the APN, there is additional information you will need to enter.

1. Select *Misc* from the menu on the left side under the Common group.

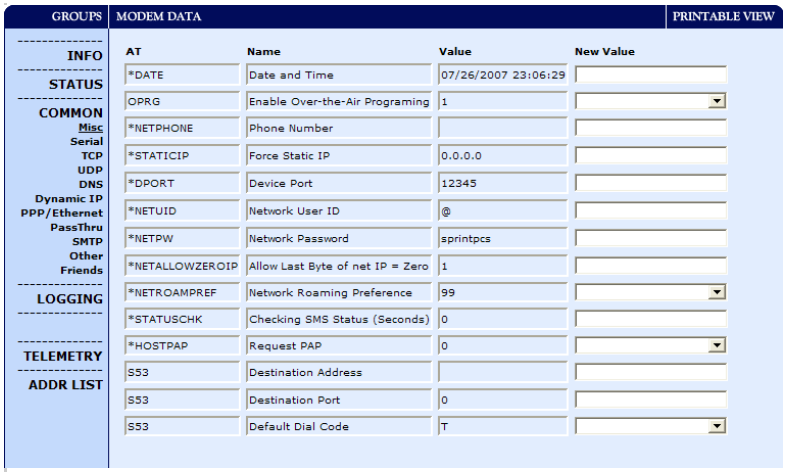


Figure 3-10: AceManager : Misc

2. Enter the NAI into the new value field for *NETUID and enter your network password into the new value field for *NETPW.

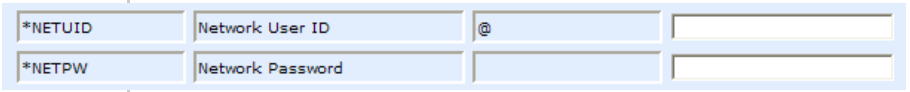


*Figure 3-11: AceManager : Misc - *NETUID, *NETPW*

4. Write the Settings to the PinPoint X

a. Click the Write button on the tool bar of AceManager.

b. Wait for the message “Write Successful” to appear in the status bar.

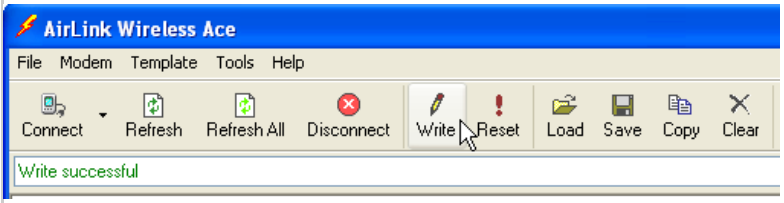


Figure 3-12: AceManager : Write

c. Reset the PinPoint X.

4: Hardware Installation of the PinPoint X

- Connecting to Power
- Connecting to a Computer or other Device
- Indicator Lights
- Mounting

Your PinPoint X should be mounted in a position that allows easy access for the cables so they are not bent, constricted, in close proximity to high amperage, or exposed to extreme temperatures. The LEDs on the front panel should be visible for ease of operational verification. You should ensure that there is adequate airflow around the modem but that it is kept free from direct exposure to the elements, such as sun, rain, dust, etc.

In a mobile location, such as a car or truck, ensure the location is secure both against abrupt movements of the vehicle and from other items coming into contact with the modem.

Caution: *The PinPoint X is in a hardened case and designed for use in industrial and extreme environments. However, unless you are using cables expressly designed for such environments, they can fail if exposed to the same conditions the PinPoint X can withstand.*

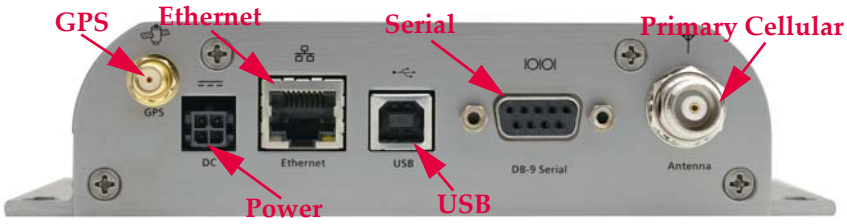


Figure 4-1: PinPoint X Connectors

Antennas selected should not exceed a maximum gain of 5 dBi under standard installation configuration. In more complex installations (such as those requiring long lengths of cable and/or multiple connections), it's imperative that the installer follow maximum dBi gain guidelines in accordance with the

radio communications regulations of the Federal Communications Commission (FCC), Industry Canada, or your country's regulatory body (if used outside the US).

Your PinPoint X will work with most Dual-Band PCS cellular antennas with a connector that works in the high and low frequencies of the cellular technology of your modem. Connect the primary antenna or primary RF cable directly to the antenna connector on the back of the PinPoint X.

Tip: *When using a cable to an antenna placed away from the modem, minimize the length of your cable. All gain from a more advantageous antenna placement can be lost with a long cable to the modem.*

GPS

Your PinPoint X will work with most standard active GPS antennas. Connect the GPS antenna or cable directly to the threaded SMA connector.

Mount the GPS Antenna in the vehicle. The less the cable is wrapped and bound together, the better it will perform. Place it on the roof, or on the dash, or rear panel where it has a good view of the sky (greater than a 90 angle view of the sky).

There are three options for antenna mounts:

- Magnetic roof-mount
- Through glass-mount
- Permanent mount

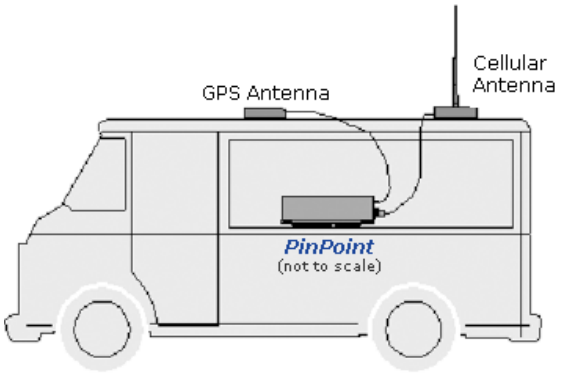


Figure 4-2: GPS Antenna Placement for a Vehicle

Connecting to Power

Your PinPoint X can be used with either DC, available in most automobiles, or 110 AC, standard US wall power, with the appropriate power adapter. DC cables and AC adapters are available as optional accessories in addition to the one included with your PinPoint X.

Note: When using a DC power source (such as a car battery or solar cell), Sierra Wireless recommends placing a fuse (1-2 Amp) on the line close to the power source to protect your power source from possible surges due to shorts or other line issues.

The DC power cable positive lead should be connected to the battery or power source positive terminal. The power cable negative lead should be connected to the battery or power source negative terminal.

The PinPoint X has an internal polysilicon circuit breaker that opens at 0.5 to 1.0 amps of current.

If you wish to use the Standby Ignition Sense (SISE) feature of your PinPoint X, the white wire of the three wire DC power cable should be used to connect to your ignition. When SISE is enabled in the modem and the ignition sense connector is wired to your vehicle, the ignition sense will provide a link to the modem to enable it to enter a low-power, standby mode when your vehicle is turned off and power up more quickly when the ignition is started.

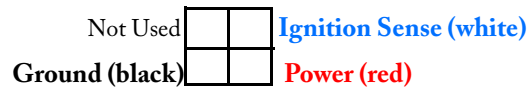


Figure 4-3: Ignition Sense power connector

Connecting to a Computer or other Device

Figure 4-4: Ethernet

The Ethernet port of your PinPoint X can be connected directly to a computer or other Ethernet device with either a cross-over cable or a straight-through cable. The Ethernet port on the PinPoint X is auto-sensing and will auto-detect the speed of the connecting device for 100baseTX or 10baseT. If you are

connecting the modem to a hub or switch you should use a straight through cable or use the uplink port on the hub or switch with a cross-over cable.

Figure 4-5: Serial

The serial port can be connected directly to most computers or other devices using a standard straight through cable. If you have a DCE device, you will need a null modem or null modem cable.

Figure 4-6: USB

Your PinPoint X's full-speed (12 Mbit) USB 2.0 port can be connected directly to most computers or other devices using a standard full-speed USB 2.0 cable. If the computer or device you are connecting or the cable is not rated for full-speed, the modem will communicate at a reduced speed to match. The PinPoint X functions as a device, not a host.

When it is connected to a computer, the USB port should be seen as a COM port or Ethernet port after the applicable driver is installed.

The PinPoint X has a standard B connector.

Figure 4-7: I/O

Your PinPoint X also has an I/O port with digital inputs, analog inputs, and relay outputs which can be connected to external devices.

The I/O port can use an optional I/O harness available through Sierra Wireless.

Indicator Lights

When your PinPoint X is connected to power and an antenna, there is a specific pattern to the lights to indicate its operation mode.

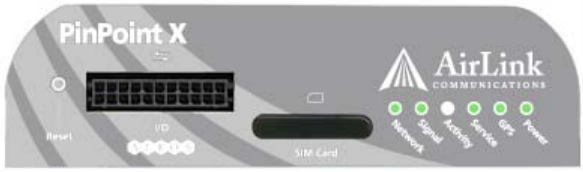


Figure 4-8: PinPoint X Indicator lights

- **Network** - Indicates a successful connection to the cellular network with an IP address given and a channel acquired.
- **Signal** - Light shows the strength of the signal and may be nearly solid (strong signal) or flashing (weaker signal). A slow flash indicates a very weak signal.

RSSI LED Ranges

RSSI/Signal LED Status	Ranges of RSSI (dBm)
On Solid	Equal to or stronger than -69
Fast Blink	-70 to -79
Normal blink	-80 to -89
Slow Blink	-90 to -99
Extinguished	Equal to or weaker than -100

- **Activity** - Lights will flash as data is transferred to and from the PinPoint modem on the remote network.
- **Service** - Indicates when the connection is HSDPA or UMTS. Unlit indicates EDGE or GPRS.
- **GPS** - Indicates a GPS fix. When lit, the PinPoint X has GPS coordinates to report.
- **Power** - Indicates the power adapter is connected and there is power getting to the PinPoint X.

- The **Reset button** (on the left side of the PinPoint X) has two functions. If it is quickly depressed and released, the modem will simply power cycle the internal hardware. If, however, the reset is depressed and held for several seconds (count 10 slowly, and wait for the power light to go off after the light pattern stops), the ALEOS configuration settings will return to the factory defaults.

Caution: *If you reset the modem configuration using the reset button, you may to reconfigure your APN.*

Light Patterns

The LEDs on the front of the modem will respond in different patterns to indicate modem states.

- **Normal** - Each LED, mentioned above, lit as applicable.
- **Start up** - The LEDs will cycle from left to right.
- **PassThru mode** - Network and Signal LEDs will blink in tandem. The Activity LED will blink when transmitting or receiving data.
- **SOS** - The Network Chan and Service Err or Serv LEDs will blink alternate to each other.
- **Low Power** - All LEDs will be off except the power LED which will blink every 3 seconds.
- **Configuration Reset** - The LEDs will cycle left to right and then right to left 4 times.
- **Authentication Failure** - The Network, Signal, and Activity LEDs blink every 2 seconds.
- **Data Retry** - The Network, Signal, and Activity LEDs blink every 3 seconds.
- **Invalid MAC Address or Ethernet Initiation Fail** - The Service LED will blink.

Mounting

The integrated mounting with keyhole screw mounts on the PinPoint X will allow you to secure your modem nearly anywhere, quickly and easily, without the need for a separate bracket.

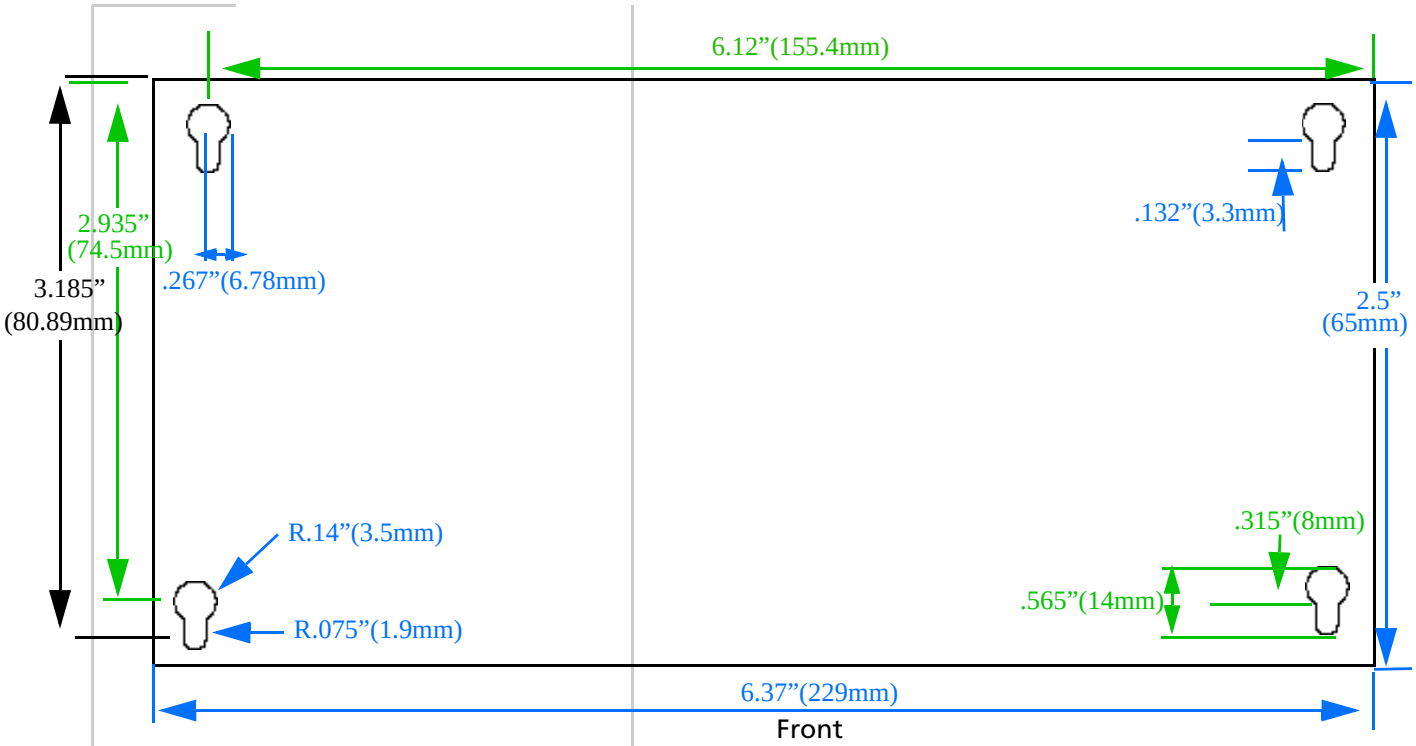


Figure 4-9: Diagram of the PinPoint X base

5: Configuring your PinPoint X

5

- Using AceManager
- Using Templates
- Using a Terminal Application with AT Commands

With ALEOS as its “brain”, the PinPoint X is a highly configurable device, more than just a “dumb” modem.

To configure your PinPoint X, you have two options. You can use the configuration and management applications of the AceWare suite or you can use a terminal emulator application such as HyperTerminal, PuTTY, or many others.

Since the AceWare applications are designed for ease of use, nearly all descriptions and screen shots of PinPoint X configuration in this guide and Application Notes are done with AceManager. In addition to the various chapters in this guide giving information and directions about using the features of your PinPoint X, the Configuration Commands appendix briefly describes all the commands available. To get a more expanded view of the other AceManager features, refer to the AceManager Guide.

A full listing of all the configuration commands for you modem are in Appendix A.

Using AceManager

AceManager is a free utility and is available on the product CD or can be downloaded from the Sierra Wireless America website:http://www.sierrawireless.com/support/AirLink/default.aspx.

Tip: *AceManager is the same application as Wireless Ace. The name was changed to fit better with its features.”*

1. Start AceManager

Start > All Programs > AirLink Communications > AceManager

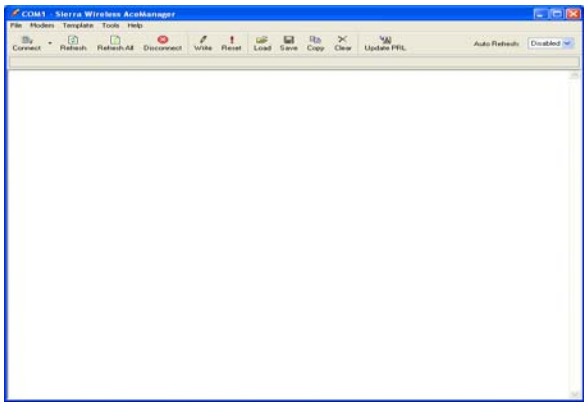


Figure 5-1: AceManager

2. Connect to your PinPoint X

a. Click the Connect button.

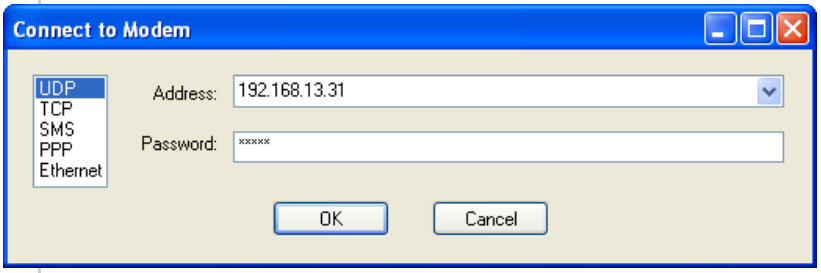


Figure 5-2: AceManager : Connect to Modem

b. Select a connection method:

- If you are connecting remotely, you can use UDP, TCP, or SMS.
- If you are connecting locally with the modem connected directly to your computer using a serial cable, you can use PPP.
- If you are connecting locally with the modem connected directly to your computer using an Ethernet cable, you can use UDP, TCP, or Ethernet.

c. Enter the connection information.

- For UDP or TCP, if you are connecting locally, use the *HOSTPEERIP of the modem to connect. The default for the *HOSTPEERIP is 192.168.13.31.
- For SMS, enter the phone number of the modem and select your wireless carrier.
- For PPP, select the COM port to which the modem is connected.

d. Enter the password. The default password will be entered for you.

e. Select *OK*.

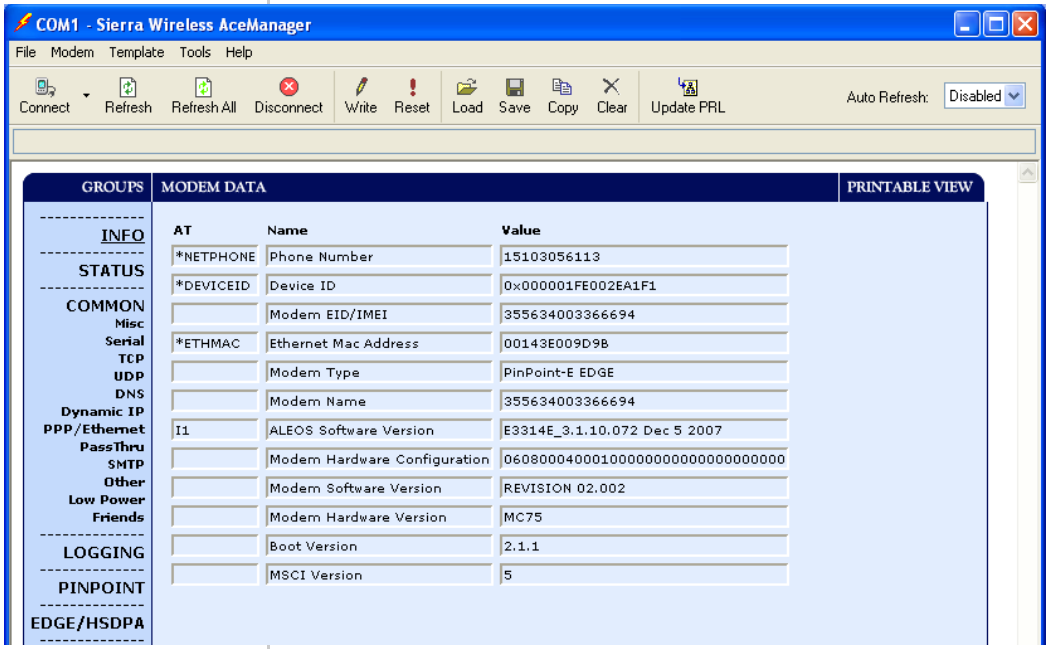


Figure 5-3: AceManager : Connected

3. Enter the configuration options

a. On the left side of AceManager is the *Groups* menu. Select the appropriate group as needed or directed.

b. Enter your changes in the *New Value* column by typing in the desired change or using the drop down menus.

c. The current configuration is shown in the *Value* column.

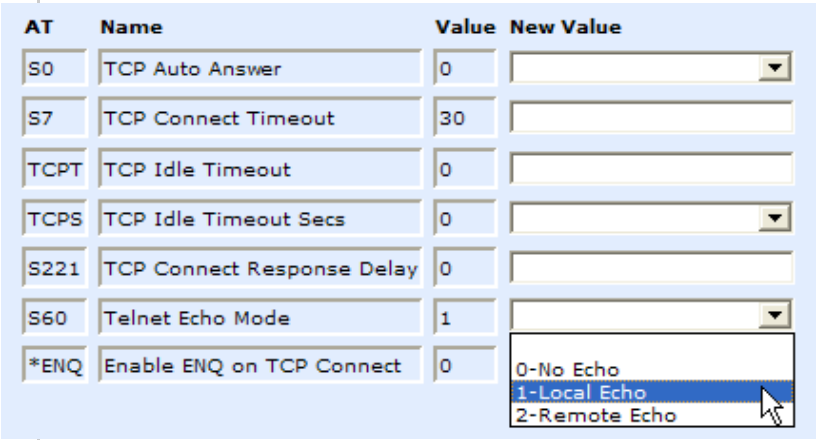


Figure 5-4: AceManager : Changing values

4. Write the changes to the modem

a. Click the Write button on the tool bar of AceManager.

b. Wait for the message "Write Successful" to appear in the status bar.

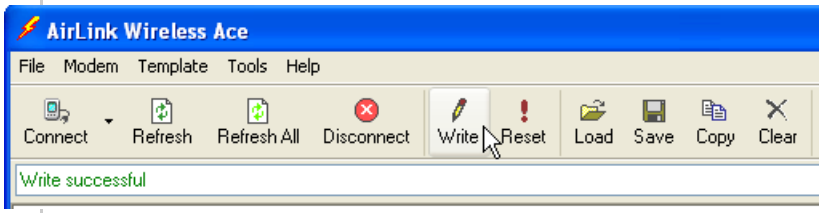


Figure 5-5: AceManager : Write

Tip: *Some configuration settings will require you to reset the modem before they will take effect. You can reset the modem by using the Reset button in AceManager or by using the reset button on the modem. You can also reset the modem by cycling the power.*

Using Templates

If you have a modem configuration that works well for your needs, using AceManager, you can save that modem's configuration as a template and then apply it to other Sierra Wireless AirLink modems.

1. Creating the Template with AceManager

a. Configure the "master" modem.

b. Click the *Copy* button on the tool bar to transfer all the configured settings to the New Value column.

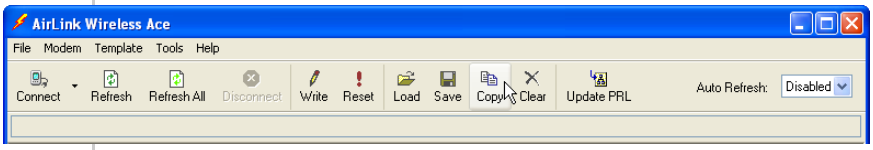


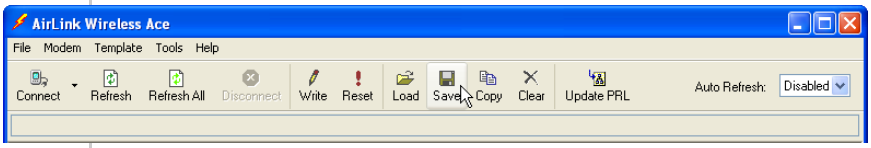
Figure 5-6: AceManager : Copy

c. Remove settings which are specific to your "master" modem or verify settings are applicable to all your modems.

Note: Some of the configuration settings are specific to individual modems. You do not want to have those settings in your saved template otherwise the modems you configure with the template could cease to work with the cellular or local network.

- Cellular Technology specific settings (EDGE/HSDPA group)
- *MODEMNAME
- *HOSTPRIVIP
- *HOSTPEERIP
- *HOSTUID
- *HOSTPW

d. Click the *Save* button on the toolbar.



e. Type in a file name that is descriptive of the template (so you can find it easily later) and save it to a location on your computer.

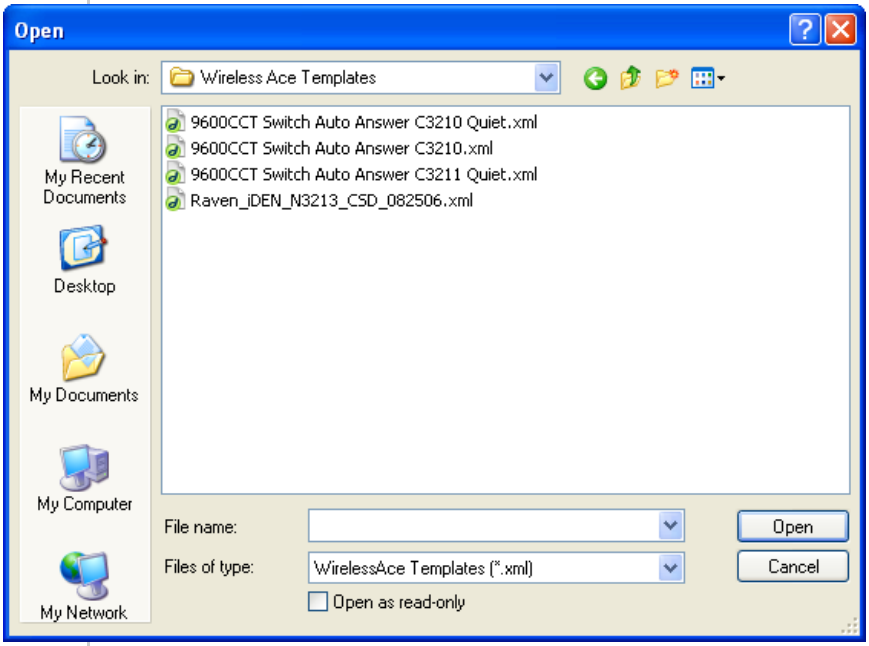


Figure 5-7: AceManager : Save Template

2. Applying a Template to one modem with AceManager

You can use a template you created yourself, using the steps above, or a template provided by your AirLink representative or someone in your company who has set up a modem template. The template you wish to apply must be saved to your hard drive.

a. Load the template.

1. Connect to the modem you want to configure using AceManager.
2. Click on the *Load* button on the toolbar.

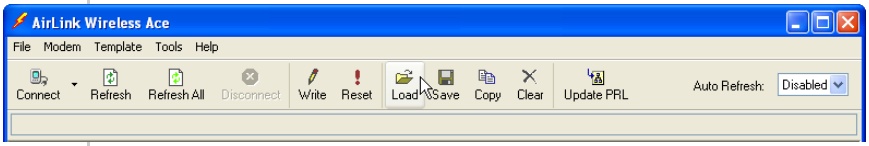


Figure 5-8: AceManager : Load

3. Select the template you have saved (you may need to change folders if you saved it to a different location).

b. Verify the configuration settings.

Tip: *After you load the template, it's best to go back over the AceManager groups to make sure all the settings are what you require.*

---

c. Click the *Write* button on the toolbar to write the configuration to the modem. Wait for the "Write Successful" message.

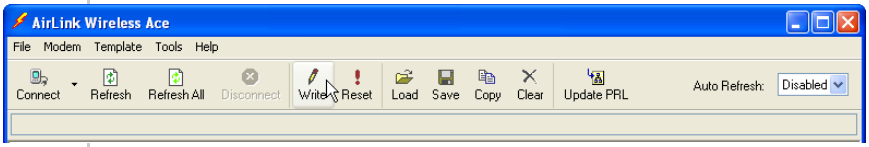


Figure 5-9: AceManager : Write

d. Reset the modem.

Caution: *Many of the configuration settings will not take effect until the modem has been reset.*

Tip: *You can use common settings on one modem to configure those same settings on another modem even of a different type. For example, you can use the serial settings of a modem (such as PinPoint X or Raven X) to configure the serial settings of a PinPoint X. Settings not applicable to the modem on which you are loading the template, will be discarded.*

3. Optional: Applying one template to several modems simultaneously with AceNet

AceNet allows you to connect to and monitor several modems at the same time. For your convenience, you can also apply a single template to selected modems simultaneously.

Connecting to the modems with AceNet is covered in the AceNet User Guide.

Caution: *When applying a template in AceNet, it is even more important to make sure there are no non-general settings in the template from the "master" modem.*

Unlike AceManger, AceNet does not check the modem type before applying the template. Settings not applicable, such as a USB setting from a Raven XT template being applied to a Raven X, are not read by the receiving modem. You will get a "partial success" status if all items in a template cannot be applied by the receiving modem.

a. Select modems to configure with the template.

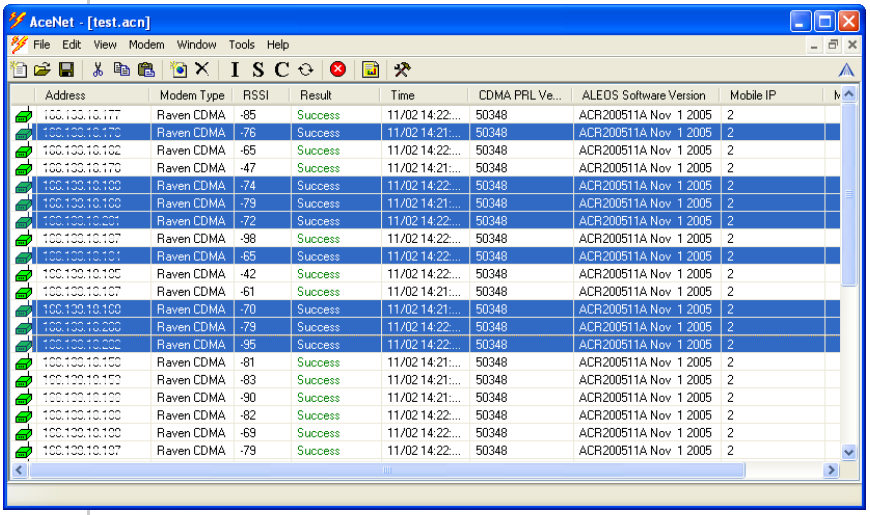


Figure 5-10: AceNet : Selected modems

Tip: *Click on the first with your mouse and, with the control button held down, click the additional modem.*

b. Select the *Modem* option in the tool bar and then select *Apply AceManager Template*.

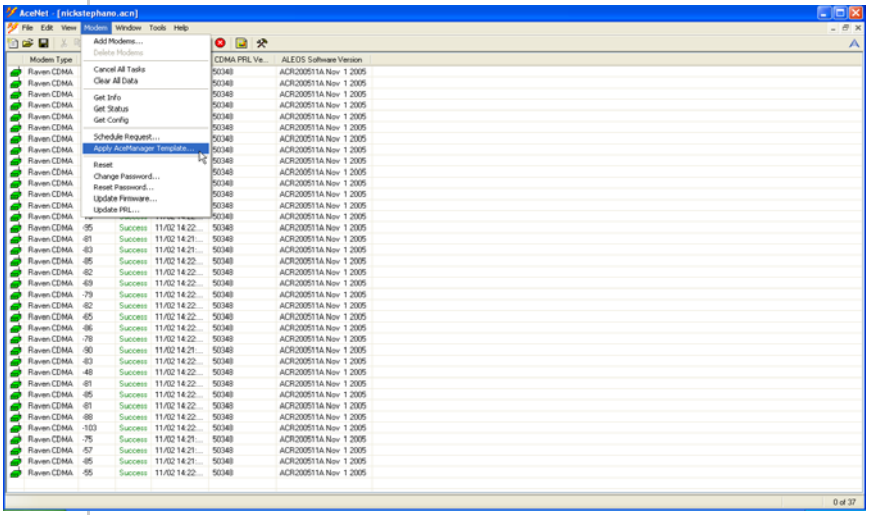


Figure 5-11: AceNet : Modem menu

c. Either type in the Template file name, or click browse and select the template file you want to apply (you may need to change folders).

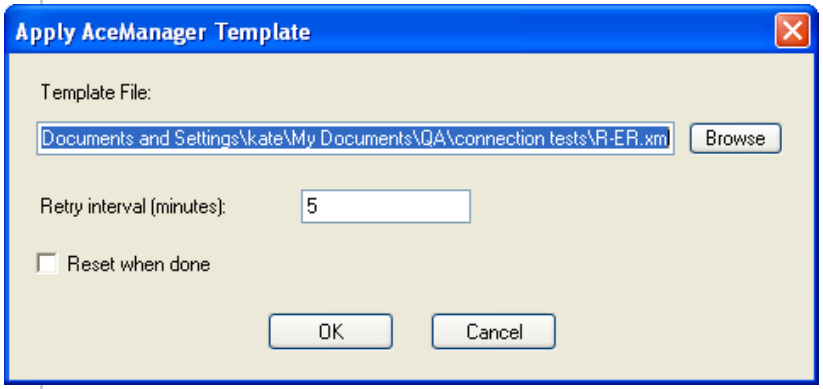


Figure 5-12: AceNet : Template select

d. Set the Retry Interval and check if you want to have the modems Reset when the template has been applied.

Using a Terminal Application with AT Commands

You can access and configure your PinPoint X using a terminal application such as Microsoft HyperTerminal, PuTTY, or similar. The following directions are for HyperTerminal which is part of a standard installation of Windows XP.

Start > All Programs > Accessories > Communications > HyperTerminal

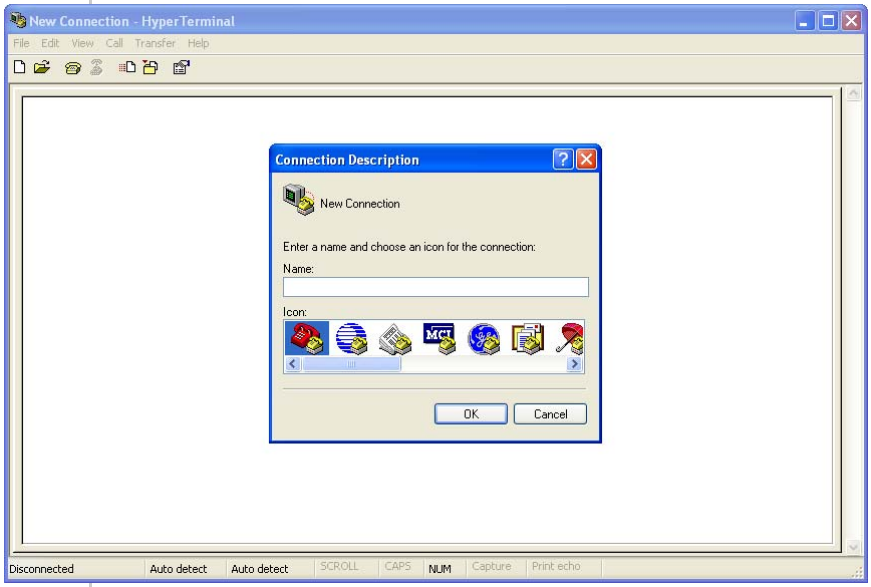


Figure 5-13: HyperTerminal

1. Choose a name and icon for your connection.

a. Choose a name for your connection, such as *PinPoint X* or *Sierra Wireless AirLink Solutions*. The name and icon are only for your own reference so you can find the connection at a later date.

Tip: *If you want to have a connection saved for both local and remote, it is recommended the connection name reflect the connection type, i.e. PinPoint X local.*

b. Select OK.

2. Connect To

Using Serial:

a. Select *COM1*, or the comport to which the modem is connected, for the "Connect Using".

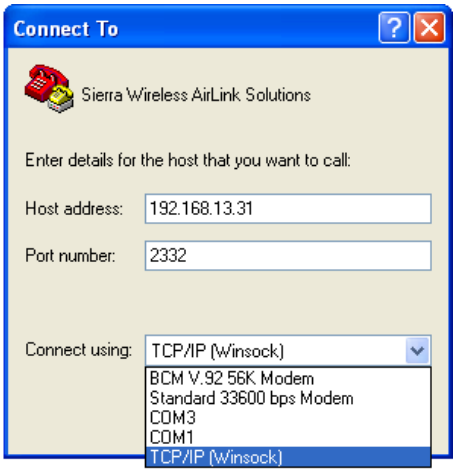
Figure 5-14: Connect To

Using Ethernet:

a. Select *TCP/IP (Winsock)* for "Connect Using".

b. Type in *192.169.13.31* for Host Address.

c. Change the "Port Number" to *2332*.



d. Select *OK*.

3. Port Settings (serial only)

a. Change or verify the settings:

- Bits per Second: 115200 (default)
- Data Bits: 8
- Parity: None
- Stop Bits: 1
- Flow Control: Hardware.

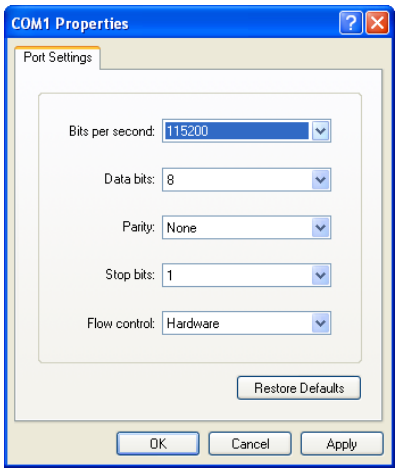


Figure 5-15: Port Settings

Tip: *If you have configured the PinPoint X for settings different than the defaults for Bits per Second, Data Bits, Parity, and/or Stop Bits, you will need to use your changed settings.*

b. Select OK.

4. Connected

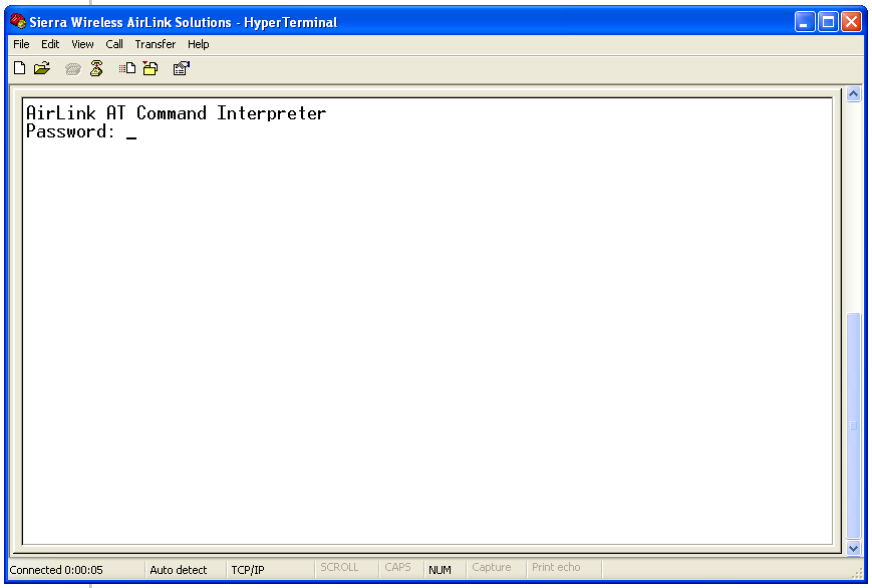


Figure 5-16: HyperTerminal : TCP/IP connected

a. If you are prompted for a password, enter *12345*.

Tip: *You will not be prompted for a password if you connect using a COM port.*

b. Type *AT* and press *Enter*. You should get a reply of "OK" or "0".

c. To see what you are typing as you type it, you will need to turn on the echo and verbose mode. Type *ATE1V1* and press *Enter*.

d. If you get a reply of "OK", then you entered the command successfully. If you get a reply of "0" or "ERROR", try entering the command again.

AT Commands

When using a terminal application, you will need to manually type in each command.

- For most commands, when you are entering them using a terminal connection, you will need to preface the command with AT (exceptions are noted), i.e. *ATA* which is listed as *A*.
- Some commands have specific parameters while other commands will take whatever you type.

- Required variable parameters are denoted with italicized text, example, D*n*. The *n* is variable.
- Acceptable parameters and/or specific formats are listed with each command.
- Most commands with parameters can be entered with ? to read the current value (for example, *AT&D?* will respond with "2" if the default has not been changed).
- Optional parameters are denoted with square brackets [ ].
- AT Commands are not case sensitive. A capital "E" is the same as a lower-case "e".
- When you are using a terminal connection, if you enter a command which is recognized by the PinPoint X, it will respond with "OK". If the command is not recognized, the response will be "ERROR".
- Those commands applicable only to certain model numbers of the PinPoint X will be noted.

Caution: *Symbols listed with commands, such as* *******, ***/***, ***&***, *or* ***?****, are part of the command and must be included. Commands with symbols other than* ******* *may require PassThru mode.*

6: Universal Serial Bus (USB)

- Changing the USB port communication
- Installing the USB driver
- Using the Virtual Ethernet Port
- Using the Virtual Serial Port

The PinPoint X is equipped with a USB port which increases the methods by which you can send and receive data. The USB port can be set to work as either an Ethernet port or a virtual serial port. A driver installation is required to use the USB port in either mode.

Note: It is recommended that you use a USB 2.0 cable with your PinPoint X and connect directly to your computer for best throughput.

Changing the USB port communication

The command to change the port configuration is *USBDEVICE and it is in the USB group of AceManager.

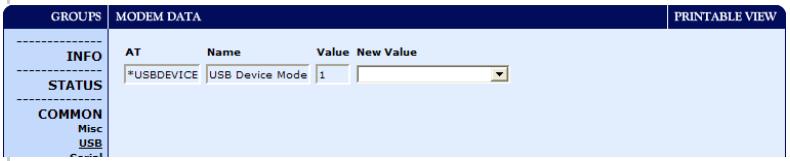


Figure 6-1: AceManager : USB

By default, the port is set to work as a virtual Ethernet port (*USBDEVICE=1).

To change the USB port to allow virtual serial port communication, disable the Ethernet port emulation, set *USBDEVICE to 0.

*Note: If you use a terminal connection with the USB port to change *USBDEVICE, the change is immediate. Your connection will be terminated after inputting the command.*

Installing the USB driver

1. Set the Port Type

Virtual Ethernet port is the default setting for the USB port. If you want to install the virtual serial port, change the USB port configuration using the directions above.

2. Connect the PinPoint X to your computer's USB port

When you connect the PinPoint X for the first time to a USB port on your computer, Windows should detect a new device and prompt you to install the driver.

Note: Windows will see each port type as a different USB device and will see every port on your computer separately. If you change the port type on the PinPoint X or connect to a different USB port on your computer or hub, Windows will see it as a new device.

Figure 6-2: Found New Hardware Wizard

a. To start the install of the USB virtual Ethernet driver, select No, not this time and click Next.

b. Select Install from a list of specific location and click Next.

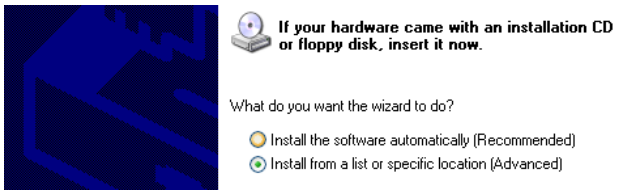


Figure 6-3: Hardware Wizard : Location options

3. Install the driver from a specific location

a. Select and/or enter the location of the driver.

- If the driver is on the CD and the CD is in your drive, you can just select Search removable media.
- If you have installed AceManager or the Setup Wizard, the drivers have been conveniently copied to your hard drive. Enter C:\Program Files\Common Files\AirLink as the location to search.
- If you will be installing the driver from a file downloaded from the Sierra Wireless website, select Include this location in the search and type in the location where you downloaded the file.

b. Click Next.

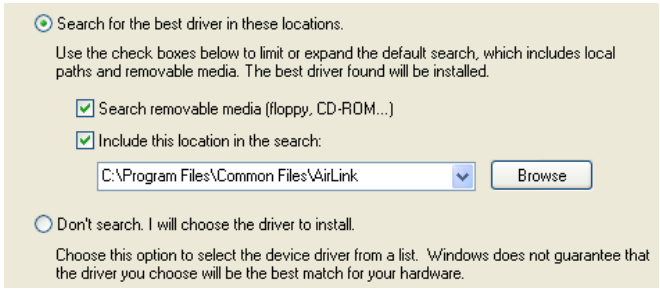


Figure 6-4: Hardware Wizard : Install location

After you select the location, the installation should begin. If you get a message asking if you want to continue the installation, click Continue Anyway.

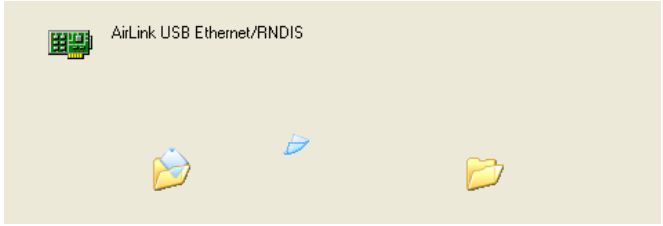


Figure 6-5: Hardware Wizard : Installing

c. Click Finish to complete the installation. The driver should be enabled without any need to reboot your computer.

Figure 6-6: Hardware Wizard : Finish

Note: If you are already connected to the modem with an Ethernet cable, when you complete the installation of the USB Ethernet driver, your computer will not use the USB connection initially. You may need to reboot your computer before you can use the USB port as an Ethernet connection to the modem.

4. Optional: Verify and Configure the Virtual Port Settings

Virtual Ethernet

The USB Ethernet connection will show up in your Network Connections as a Local Area Connection.

Tip: *If you also have an Ethernet card on the computer or have installed the USB Ethernet to more than one USB port on your computer, the USB Ethernet may show up with a number.*

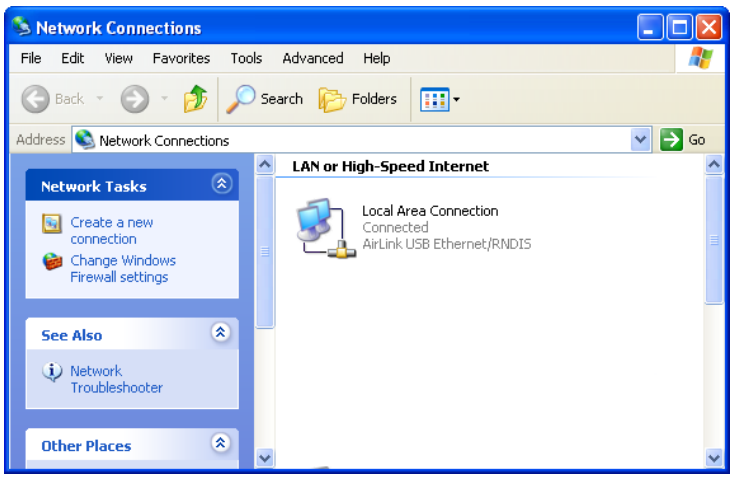


Figure 6-7: Network Connections

You can also verify the installation by looking in the Device Manager.

a. Click on Start > Control Panel.

b. Double-click on the System icon.

c. Select the Hardware tab and click the Device Manager button.

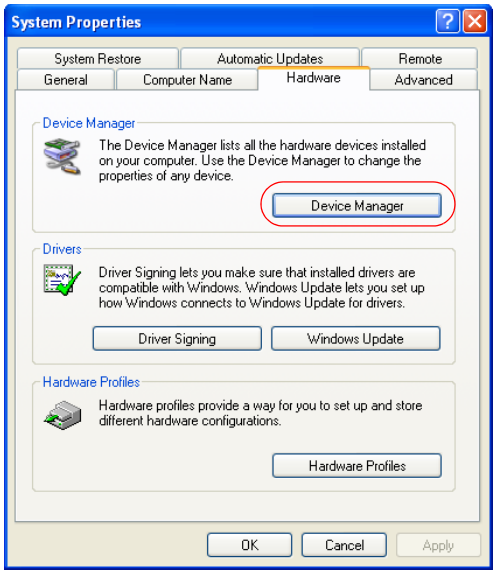


Figure 6-8: System Properties

d. Click on the + in front of *Network Adapters*.

The newly installed driver, AirLink USB Ethernet/RNDIS, should be displayed. If the driver is displayed with a # and number behind the driver name (such as, AirLink USB Ethernet/RNDIS #2), it means more than one is installed on your computer, most likely for different USB port. More than one copy of the driver should not cause any problems since only the connected port and its driver would be active.

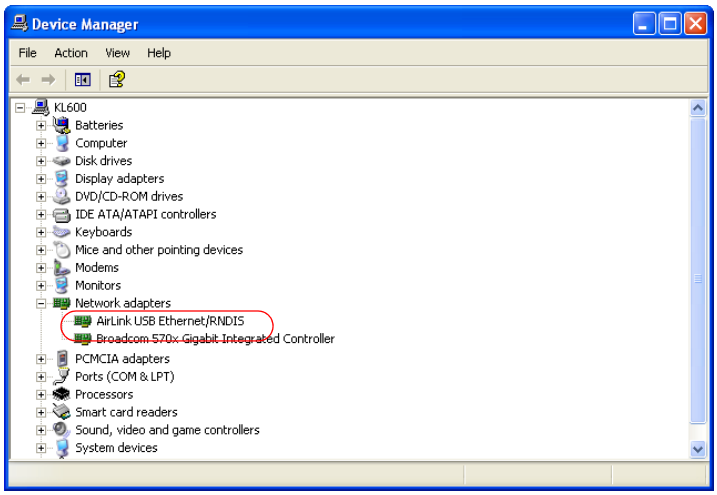


Figure 6-9: Device Manager - Ethernet

Virtual Serial

You can verify the installation by looking in the Device Manager.

a. Click on Start > Control Panel.

b. Double-click on the System icon.

c. Select the Hardware tab and click the Device Manager button.

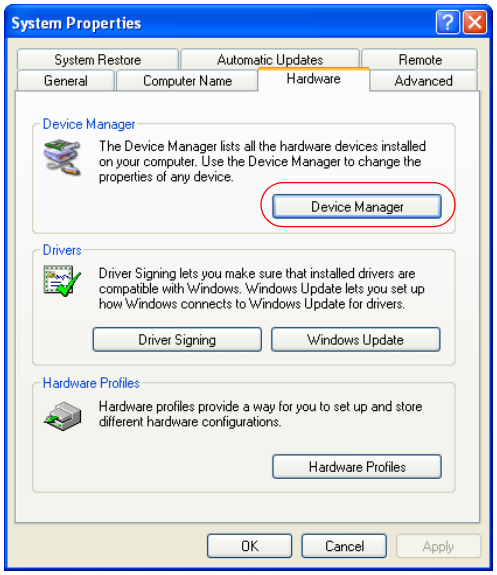


Figure 6-10: System Properties

d. Click on the + in front of *Modems*.

The newly installed driver, AirLink USB Serial Port, should be displayed.

Tip: *If the driver is displayed with a # and number behind the driver name (such as, AirLink USB Serial Port #2), it means more than one is installed on your computer, most likely for different USB port. More than one copy of the driver should not cause any problems since only the connected port and its driver would be active.*

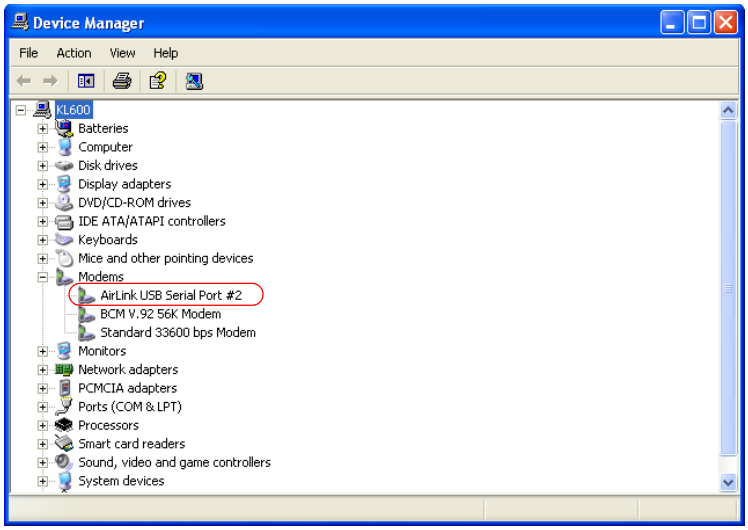


Figure 6-11: Device Manager - Serial

To connect to the modem using the USB virtual serial, most applications or utilities will require you to select or enter the serial (COM) port number. The USB connection will appear as a standard serial port, so you will need to determine its number to connect to it. The driver installation will automatically assign a port or you can change it if you wish to another unused port.

a. From the Device Manager, right click on the driver name and select Properties.

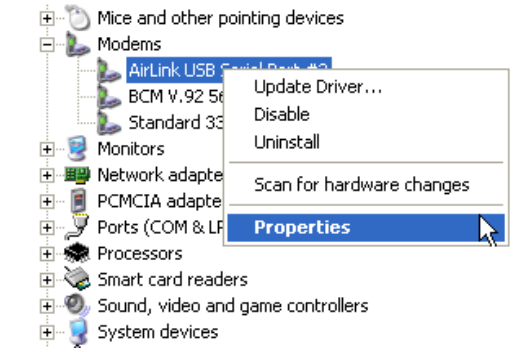


Figure 6-12: Device Manager : Driver menu

b. Select the Advanced tab and click the Advanced Port Settings button.

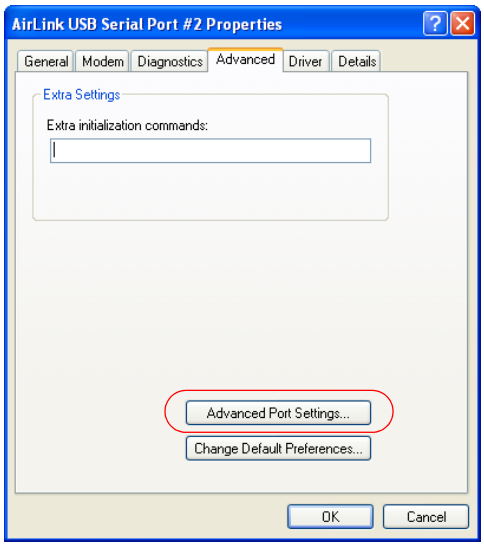


Figure 6-13: Driver Properties

c. At the bottom of the screen, the current port used will be listed. Use the drop down menu to select an available COM port number if you need to change it.

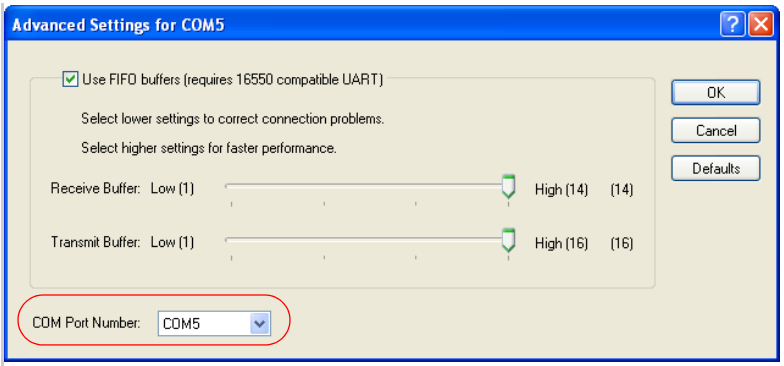


Figure 6-14: Advanced Settings

Using the Virtual Ethernet Port

Once the driver is installed, you can use the USB port just like a standard Ethernet port.

Using USB Ethernet with AceManager

In AceManager, use the UDP or TCP connection and enter the IP address of the modem (*192.168.13.31* by default) and the password (*12345* by default).

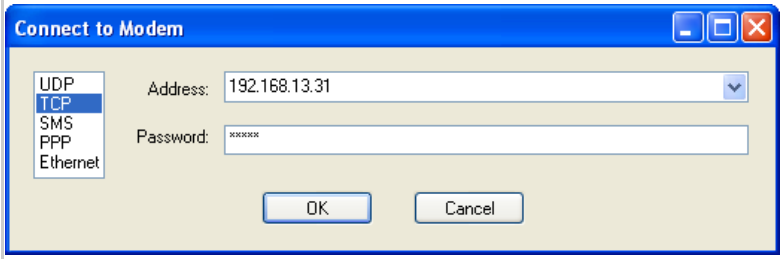


Figure 6-15: AceManager : TCP

Using USB Ethernet with a Terminal Emulation Utility

Configure your terminal application for telnet communication.

a. In HyperTerminal, select TCP/IP (Winsock)

b. Use the IP address of the modem (*192.168.13.31* by default) as the destination and use the telnet port of the modem (*2332* by default).

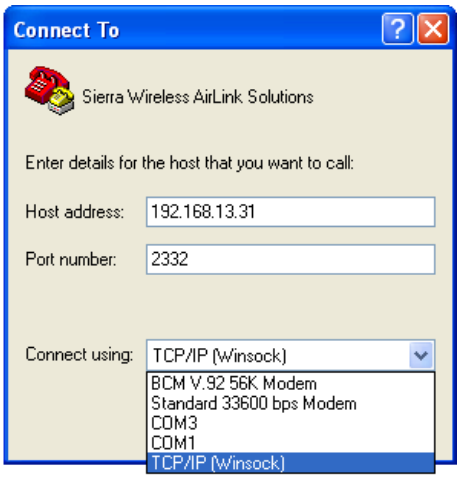


Figure 6-16: HyperTerminal : TCP

c. Enter the modem password (*12345* by default) when requested.

Using the Virtual Serial Port

Once the driver is installed, you can use the USB port just like a standard serial port.

Using the USB virtual serial port with AceManager

In AceManager, the USB virtual serial port connection will appear as a standard serial port. Use the PPP connection and select the COM#serial port of the USB connection.

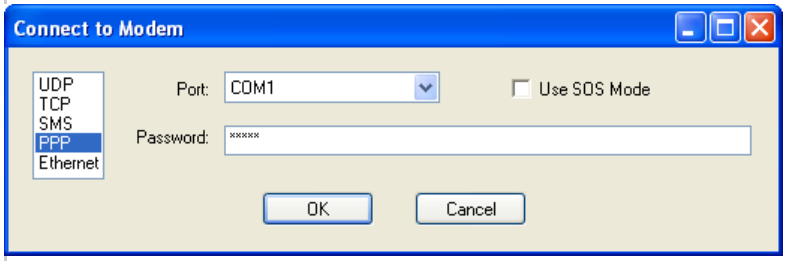


Figure 6-17: AceManager : PPP

Tip: *You will need to open AceManager after you connect the USB cable to your computer for AceManager to have access to the USB Serial PORT.*

Using the USB virtual serial port with a Terminal Emulation Utility

a. Select the serial port of the USB connection when prompted for a COM port.

b. Change the Bits per Second to 115200 (default), Data Bits to 8, Parity to None, Stop Bits to 1, and Flow Control to Hardware.

c. You should also need to make sure your connection uses Auto Detect for the terminal emulation.

7: Inputs, Relay Outputs, and Power Status

- Capturing External Events
- Power Modes and Information

The PinPoint X has special features for use in a mobile environment. The PinPoint X can be configured to monitor the inputs and respond to specific types of events. The PinPoint X can also be configured to change its power mode in order to conserve power. These features can be configured to your needs.

Capturing External Events

The PinPoint X is equipped with an I/O port interface which includes 4 digital inputs, 4 analog inputs, and 2 relay outputs. These may be connected to sensors and switches to monitor vehicle status and remotely control equipment.

Figure 7-1: PinPoint X I/O port

Analog Inputs

The analog inputs will report a specific voltage ranging from 0 to 30 in increments of 0.03 volts. This allows a fine degree of monitoring for a scaling device.

- Monitoring a voltage or power usage.
- Monitoring an oscilloscope.
- Monitoring temperature.
- Monitoring an incremental gauge.
- Monitoring an internal fan.
- Monitoring a vehicle payload.
- Monitoring the elevation of a tow bar.
- Monitoring a vehicle's battery use.

Digital Inputs

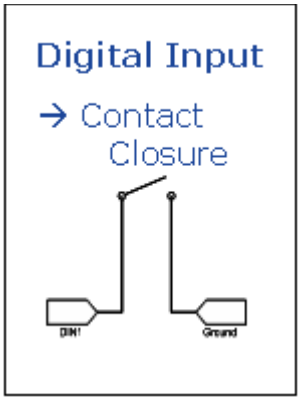


Figure 7-2: Digital Input Contact Closure

By measuring contact closures on switches, the digital inputs can report a simple open or closed state. Each of the four digital inputs can be wired to the two ground signals via a switch. When the switch is open, the input will read “OPEN”. When the switch is closed and the input is connected to ground, the input will read “CLOSED”.

- When a door or other latch is opened or closed.
- Counting pulses or other electronic events.
- When a gauge reaches a certain point.
- When a container fills or empties.
- When a switch or valve is opened or closed.
- When the tow bar is raised or lowered.
- Connected to a sensor, the level of fuel in a vehicle.
- When the trunk of a vehicle is opened or closed.
- When the ignition is turned on or off.

Relay Outputs

As an electronic switch which can be opened or closed (Normally Open relay), a relay can be used to transmit an action to another device by signalling to that other device an “on” or “off”. As a Normally Open relay, the circuit of the relay is disconnected (open) unless it is active. When the relay is active, the circuit is connected (closed).

- Setting off an alarm or siren.
- Triggering a process to start on another device.
- Opening or closing a valve or switch.
- Locking or unlocking a door.
- Turning a light on or off.
- Opening the vehicle’s trunk or doors.

Tip: *The relays are only capable of switching small loads. If you need a stronger signal, such as to open a door lock, you can connect the PinPoint X's relay to a stronger solenoid relay which has enough power to cause the desired effect.*

Connecting devices to the I/O Port

Note: Before you install the PinPoint X in its final location, be sure to cover all exposed wiring.

You can purchase an optional I/O Wiring Harness for the PinPoint X which can be used to attach devices to the I/O port. The harness has pre-wired leads to allow you to customize your own connections. The wires are paired and color-coded.

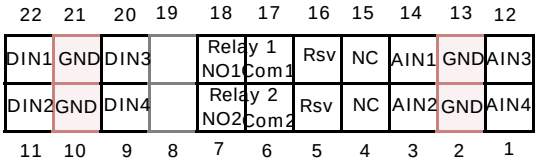


Figure 7-3: PinPoint X I/O Port Diagram (not to scale)

Table 7-1: PinPoint X I/O Port Pin-out

1. Analog Input 4	**12.** Analog Input 3
2. Analog Ground	**13.** Analog Ground
3. Analog Input 2	**14.** Analog Input 1
4. No Connect	**15.** No Connect
5. Reserved for future use	**16.** Reserved for future use
6. Com2 (for use with #7)	**17.** Com1 (for use with #18)
7. Normal Open Relay	**18.** Normal Open Relay
8. None	**19.** None
9. Digital Input 4	**20.** Digital Input 3
10. Ground	**21.** Ground
11. Digital Input 2	**22.** Digital Input 1

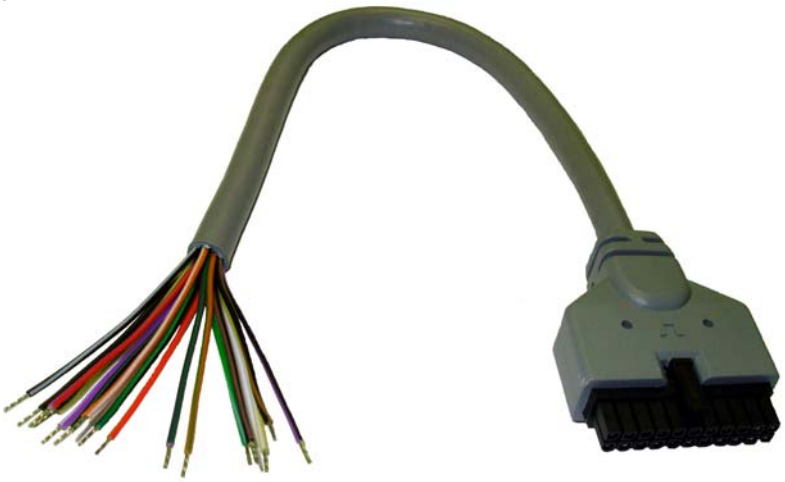


Figure 7-4: I/O Wiring Harness, AirLink part number 120-140-1014

22	21	20	19	18	17	16	15	14	13	12
O/W	Bl/Br	O/Bl	none	G/Bl	G/W	none	none	V/W	Bl/W	V/Bl
O/G	Bl/G	O/R	none	Y/Bl	Y/W	none	none	V/G	Bl/R	V/R
11	10	9	8	7	6	5	4	3	2	1

Figure 7-5: Color Corospondance to connection points

Table 7-2: Wiring Color Corospondance

1. Violet/Red	**12.** Violet/Black
2. Black/Red	**13.** Black/White
3. Violet/Green	**14.** Violet/White
4. none	**15.** none
5. none	**16.** none
6. Yellow/White	**17.** Green/White
7. Yellow/Black	**18.** Green/Black
8. none	**19.** none
9. Orange/Red	**20.** Orange/Black
10. Black/Green	**21.** Black/Brown
11. Orange/Green	**22.** Orange/White

Analog Inputs

Connect a wiring lead to an analog input (AIN) at 1, 3, 12 or 14, and the nearest ground at 2 or 13.

Digital Inputs

Connect a wiring lead to a digital input (DIN) at 9, 11, 20, or 22, and the nearest ground at 8, 10, 19, or 21, as applicable.

Caution: *Never apply voltage to the Digital inputs. The inputs can only be switched open or closed to ground.*

Relay Outputs

Connect the circuit leads to one of the two relay pairs at 6 and 7 or at 17 and 18.

Monitoring and Setting the I/O

You can monitor the status of both the digital and analog inputs using AceManager or AT Commands and also with special reports sent using RAP. In AceManager, select the I/O group.

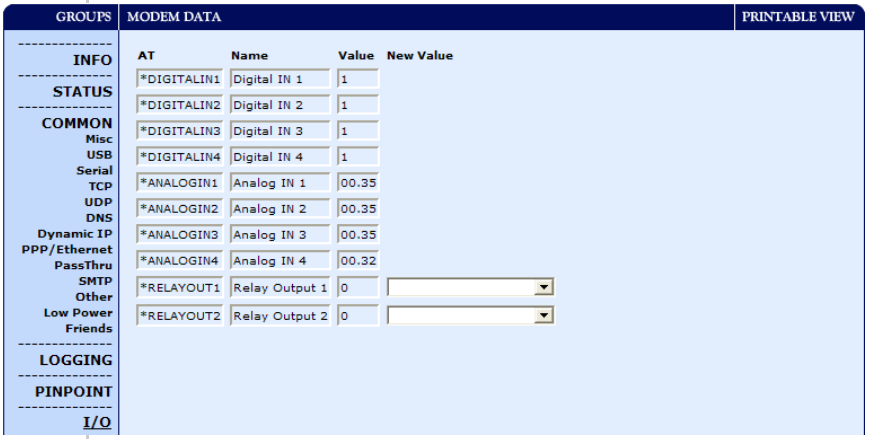


Figure 7-6: AceManager : I/O

You can monitor the status of the relays or set them using AceManager, I/O group, or AT Commands.

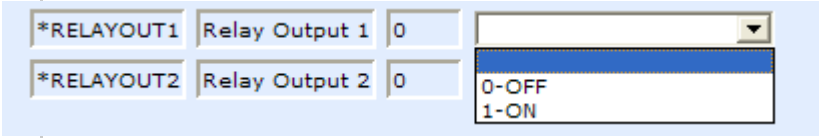


*Figure 7-7: AceManager : I/O - *RELAYOUTn*

Getting Immediate Reports Using RAP

You can set up the PinPoint X to report immediately report the state of an input when it changes by using *PPFLUSHONEVT. You will also need *PPINPUTEVT, input event reports, enabled and a server configured for your RAP reports. These settings are in the PinPoint group in AceManager.

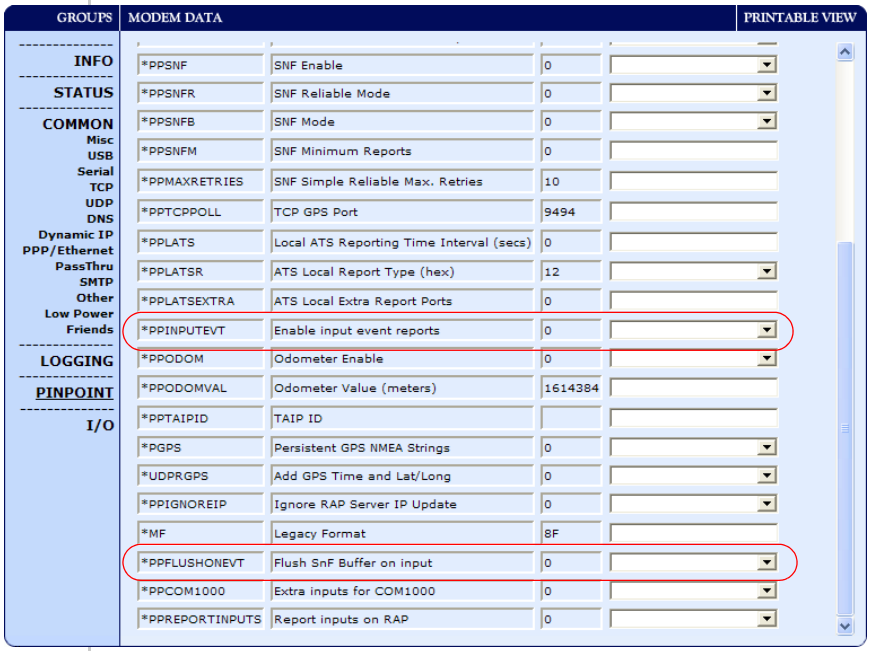


*Figure 7-8: AceManager : PinPoint - *PPFUSHONEVT / *PPINPUTEVT*

Power Modes and Information

The PinPoint X can be configured to switch power modes in response to specific events, such as when the voltage to the modem drops below a configured threshold or when the DTR changes, in order to conserve a vehicle's battery life. The stand-by state, low-power mode, will prevent the modem from draining the battery while allowing the modem to quickly power up to regular operation when it is needed.

You can configure Low Power mode using AceManager.

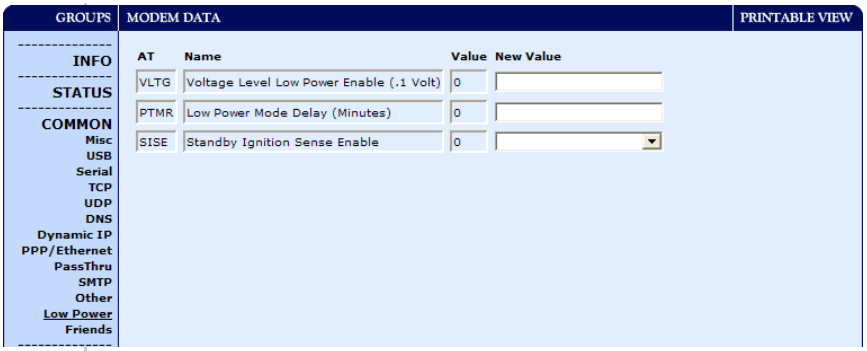


Figure 7-9: AceManager : Low Power

Wiring the PinPoint X for

When the Standby Ignition Sense is enabled and the ignition sense connector is wired to your vehicle, the ignition sense will provide a link to the modem to enable it to enter a low-power using standby mode.

The white wire of the three wire connector should be used to connect to your ignition.

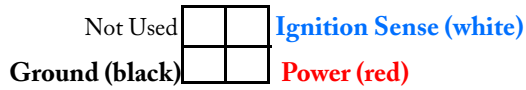


Figure 7-10: Ignition Sense Power Connector

Power Effect on Modem State

Once the transition from powered on to standby, low-power mode starts, the modem will change state to AT mode. This results in the current mode being gracefully terminated. For the brief period when the modem is preparing for low-power mode, the modem will remain in AT mode. At that time, it won't auto-answer, ATD will fail, etc. Once low-power mode is entered, the modem will then discard any data received on the host port.

When the modem is woken from low-power mode, the same behavior occurs as upon power on. The modem starts in AT mode, and then after 5 seconds will enter the default start-up mode as it is configured for the modem.

Monitoring Power-In Voltage

The current status of the power-in voltage can be monitored in AceManager. Select *Status* and scroll to the bottom.

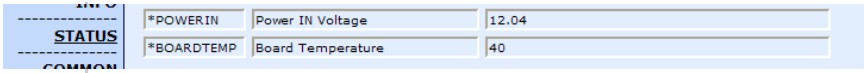


*Figure 7-11: AceManager : Status - *POWERIN/*BOARDTEMP*

8: Data Communication and Host Modes

8

- Basic Modes
- Serial Modes
- Data Communication

The PinPoint X plays the part of a HOST when a computer or another device is connected directly to its port and routes data to/from the connected device to the cellular network.

Caution: *The PinPoint X moves data from one port to the cellular network in a simple one-to-one routing. It does not employ a routing table or any complicated routing protocol.*

Tip: *If you need to have one-to-many routing, you can connect the PinPoint X to a router. The router would provide the multiple routing and the PinPoint X would provide one-to-one for the router to the cellular network and the Internet.*

As the host, the PinPoint X can use different communication modes:

Basic Modes

- **AT**: The PinPoint X accepts and responds to standard AT commands.
- **PassThru**: Direct connection to internal hardware (OEM Module) of the PinPoint X.
- **Telnet**: The PinPoint X auto-answers TCP connections to allow terminal emulation using either a local Ethernet connection or remotely using the cellular connection.

Tip: *By default, the PinPoint X is in AT Mode and allows AT Commands to be entered via terminal connection (through the local port connection) or remotely (through the cellular network). PassThru Mode can only be exited by resetting the PinPoint X. All serial modes are entered by use of a startup mode command.*

Serial Modes

- **PPP Mode**: The PinPoint X uses PPP to communicate with a device or computer connected to the serial or USB port.

- **SLIP Mode**: The PinPoint X uses SLIP to communicate with a device or computer connected to the serial or USB port.
- **UDP** and **UDP PAD**: Any data received on the serial port is assembled into UDP packets and sent to the session's associated IP address and Port (described later). Any responses received from the associated IP address and port destined for the Device Port are unwrapped and sent out the serial port.
- **TCP** and **TCP PAD**: Any data received on the serial port is packaged into TCP messages and sent to the associated connection's IP address and Port (described later). Any data received from the TCP peer is unwrapped and sent out the serial or Ethernet port.

Data Communication

- **Public and Private Modes**: The method used by the PinPoint X to pass an IP address to a connected device.
- **Keepalive**: How the PinPoint X maintains its connection to the cellular network.

Basic Modes

Start up Mode

The serial port of the PinPoint X can be configured to enter any of the modes automatically on power up (in most cases, this is also after it has registered on the cellular network). This is done by setting the Startup Mode Default to the desired mode. If this setting is non-zero, the modem will enter the specified mode after 5 seconds. If you want to cancel this behavior, the ATMD0 command can be used before the 5-second time-out expires.

You can configure the Startup Mode in AceManager at part of the UDP group.

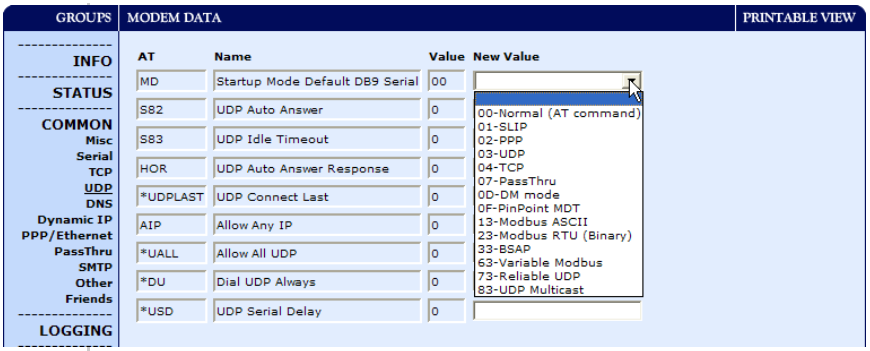


Figure 8-1: AceManager : UDP - MD

If the serial port of the PinPoint X is in any mode other than AT or PassThru, the AT command mode can be re-entered by:

- Deactivating DTR (if &D2 or Ignore DTR, S211, is not set).
- Issuing the +++ escape sequence (if Disable AT Escape, DAE, is not set).
- Resetting or Power cycling the modem.

Note: DTR needs to be asserted (S211=1 or &D0) by the host before PPP Mode, SLIP Mode, UDP PAD Mode, or TCP PAD Mode can be entered.

AT Mode

Using a terminal connection, AT commands are used to configure the modem, command it to do something, or query a setting. For a full listing of the AT commands, refer to the appendix. AceManager is a graphical user interface for most AT Commands.

- AT commands must always be terminated by **<CR>** (ASCII character 0x0D), a carriage return (pressing enter on the keyboard). Some may also include a new line or line feed **<LF>**.
- If **E=1** (Echo On), the AT command (including the terminating <carriage return) will be displayed (output) before any responses.
- Two settings affect the format of AT command output: **V** (Verbose) and **Q** (Quiet).
- If **Q=1** (Quiet On), no result codes are output whatsoever, so there is no response generated by a (non query) command.
- If **Q=0** (Quiet Off), result codes are output. The format of this output is then affected by the Verbose setting.

If Quiet mode is off, the result code is affected as follows:

For **V=1** (Verbose mode), the textual result code is surrounded by a carriage return and new line. Any AT query response is also surrounded by a carriage return and new line.

For **V=0** (Terse mode), a numeric result code is output with a single trailing carriage return (no new line is output), while any AT query response is followed by a carriage return and new line (there is no preceding output).

- For example, possible output to the AT command "AT" with carriage return (assuming quiet mode is not on) is:

  carriage return - if V=0

  carriage return and new line OK another carriage return and new line - if V=1

Note: These commands work for the port on which they are executed. For example, if the user types ATE1 and then AT&W using a serial port connection, it will set the serial port to Echo On.

PassThru Mode

In PassThru mode, the PinPoint X does not behave normally, all port communication is passed directly between the internal hardware and the computer connected directly to the modem. This mode can be used to configure hardware-specific settings. For example, provisioning, troubleshooting, communicating with legacy equipment, etc.

Caution: *ALEOS is disabled in PassThru Mode. You cannot use most ALEOS specific commands while the modem is in PassThru Mode. While in PassThru mode, you also cannot use AceManager to connect with the PinPoint.*

Issuing the "**AT\APASSTHRU**" from a terminal emulation enters this mode. The modem responds with OK, at which point a direct connection to the internal hardware is established. You can also configure the modem to enter PassThru mode on start up using **MD**.

Tip: *PassThru can only be exited by resetting or power-cycling the modem. This mode cannot be entered via a remote Telnet session.*

You can configure a string of AT commands to be sent to the PinPoint X when it enters PassThru and other PassThru settings.

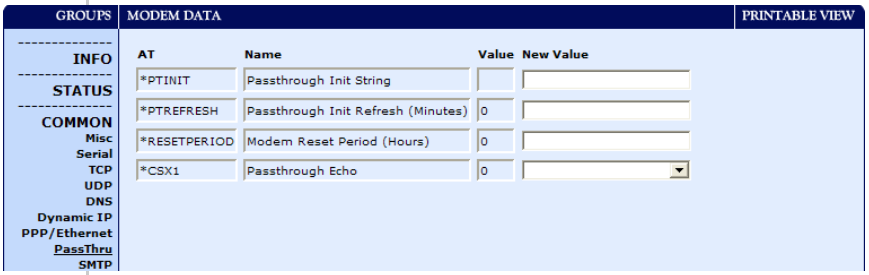


Figure 8-2: AceManager : PassThru

PassThru Mode allows only specific AT commands. Some ALEOS commands will be unavailable when the PinPoint X is in PassThru mode. The commands usable also depend heavily on the modem model number (found on the label on the top of the PinPoint X).

Note: Some internal hardware requires upwards of 20 seconds before AT commands can be entered, so be patient if there seems to be no response to AT commands.

Telnet Mode

In AceManager you can configure Telnet operation.

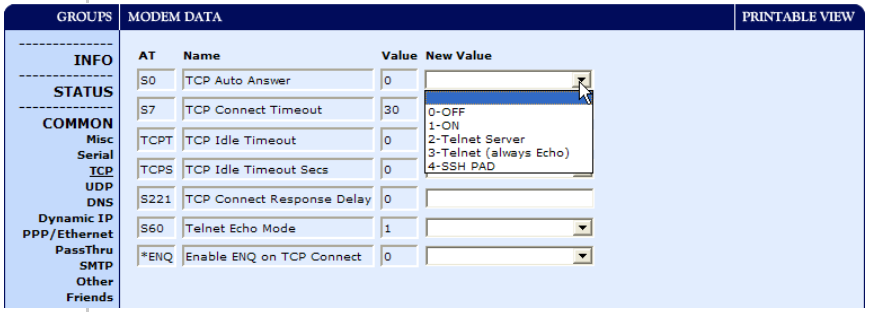


Figure 8-3: AceManager : S0

If you need to change the port for Telnet (for example, you have the default port blocked on your firewall), the option is on the Other tab. The default telnet port is 2332. You can also change the Telnet timeout, if the connection is idle, default 2 minutes.

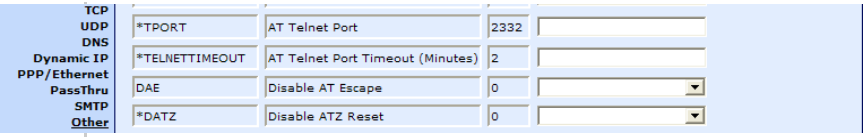


*Figure 8-4: AceManager : Other - *TPORT, *TELNETTIMEOUT.*

Serial Modes

PPP

In PPP mode, the PinPoint X acts as a PPP server, providing an IP address, and DNS servers (if available) to the connected device or computer.

PPP mode is entered from the AT mode by using any of the following commands:

- AT\APPP
- ATDT10.0.0.1
- ATDT10001
- ATD#19788 or #777 *99***1#
- CLIENT

In response to any of the preceding commands, the PinPoint X will respond with CONNECT a carriage return and new line and is ready for the host to begin PPP negotiations. The IP received by the host in the resulting negotiation will either be a private (non-routable) IP address or a public (network-routable) IP address provided by the network, depending on the settings of ***HOSTPRIVMODE**. If ***HOSTPRIVMODE=1**, the value of the private IP address can be determined beforehand by querying **S110**. The private IP address to be used can be defined with the command **AT*HOSTPRIVIP=*192.168.100.33***, substituting the desired IP address.

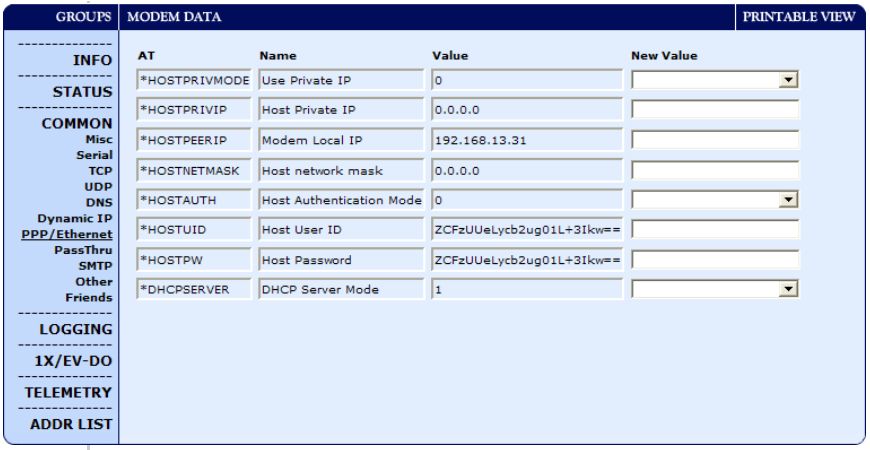


Figure 8-5: AceManager : PPP/Ethernet

Using a private IP insulates the PPP client from changes in IP addresses of the underlying network. The will perform basic NAT-like address translation on all packets.

If a public IP address is being used, any changes in the IP (as determined by the wireless network) will result in the PPP link to the host being disconnected, requiring the host to reinitiate it. The public IP is passed to the host in the PPP negotiations, so when the network forces a change, the modem has to force the host to renegotiate the PPP link to make this happen.

SLIP

SLIP mode is entered be using the "**AT\ASLIP**" command. As in PPP Mode, the IP address that the host assumes is affected by the setting of *HOSTPRIVMODE. SLIP does not negotiate the IP address with the connected device or computer, so before making a SLIP connection, the SLIP driver on that device or computer must be configured to use the IP address specified by querying **S110**.

UDP and UDP Pad

When the modem is in UDP PAD (Packet Assembly and Disassembly) Mode, all characters received on the serial port are assembled into UDP packets and sent to the remote IP address/port or the PinPoint X, and any packets received from the same IP/port-destined for the device port of PinPoint X (see *DPORT)--are disassembled and dumped onto the serial line.

A UDP session is initiated by one of the following events:

- Using the Dial UDP (DP) AT command (example, ATDP192.168.3.23/3456).

- Setting the Startup Mode Default (MD) to 3 (UDP) so that a UDP session is entered automatically when the modem registers onto the network. Serial data will be sent to the IP/port specified in S53.

Incoming UDP packets will be processed out the serial port if

- UDP auto answer is enabled (S82=2);
- The destination IP address matches that in S53 (if Friends Mode is enabled, the IP address also needs to be present on the Friends List);
- Or allow any IP is set (AIP=1);
- The modem is in AT mode (not in a current UDP or TCP session).

UDP packet assembly is affected by the values of S50 (PAD Forwarding Time-out) and S51 (PAD Forwarding Character). Data received in the serial buffer will be transmitted when the idle inter-character time-out specified in S50 (in tenths of seconds) occurs or when a character is received that matches S51 (if non-zero).

UDP Auto Answer

UDP auto answer (previously called UDP half-open) is set with S82=2. When set, the PinPoint X will automatically establish a UDP session to the source IP address and port of the UDP packet received. The PinPoint X will remain "locked" to this one remote IP/port until no data is sent or received for the time interval defined in the UDP auto answer time-out (S83). During this session, packets from other IP/port addresses will be rejected, unless *UALL is set. Whether or not an incoming packet will cause the modem to enter a UDP session is always dependent on the S53 and AIP settings.

The Normal UDP Mode (MD3) can be combined with UDP auto answer to cause the incoming serial data to be sent in UDP packets (instead of being treated as AT commands), while allowing sessions to be established from different UDP sources. A UDP session will be initiated either by incoming serial data or by an incoming UDP packet. The session, started by either method, will be terminated when no data has been sent or received for the S82 period. Once the session terminates, another may be initiated by either means.

When idle, after the time-out has occurred, the modem is in AT command mode on the serial port, and any valid AT command may be entered during this time.

Tip: *It is best to ensure the idle time-outs for TCP and UDP are never 0 if you're going to be using auto-answer, or either PAD mode. In those circumstances, you will want the modem to close the socket if the connection goes idle for too long, particularly if the other side doesn't normally close the connection.*

When the session is initiated by serial data, the new session will be established using the destination address specified in S53. The S53 setting can be changed if the connect to last UDP setting (*UDPLAST=1) is set. The address in S53 will be updated to reflect the address of the last session initiated by an incoming UDP packet. So that when new data is received over the host serial port while in the idle state, a session will be re-established with the last address. (This behavior is the same as the previous Hybrid2 (MD6) mode).

Tip: *TCP auto answer (S0) may also be set simultaneously with UDP auto answer. Then, when in the idle state, the modem will accept either a TCP or UDP incoming packet, and enter a TCP or UDP session as appropriate.*

Reliable UDP

Reliable UDP adds a simple protocol on top of UDP to provide reliable delivery of data. When data is received from the host serial port, a 2 byte header is added to the data, containing a message type and a sequence number. The PinPoint X will continue to send this data (buffering any received data in the meantime) until it receives an acknowledgement with this sequence number. If an acknowledgement is not received within the time-out period (specified in S7), the data will be retransmitted. This will continue until an acknowledgement is received or the modem is reset. Likewise any UDP packets received by the PinPoint X are expected to have this simple header. The PinPoint X will issue an acknowledgement for any valid packets which are received.

To configure the PinPoint X for a normal UDP session, you need to set the Startup Mode Default to 73 (ATMD73). If you are using two modems, configure the Destination IP and Port in each to point to each other. Serial data will then be sent reliably between the two.

Caution: *Although it adds reliability, the simple implementation of the Reliable UDP mode in the does not check for duplicate packets.*

UDP Multicast Mode

UDP Multicast mode results in any data received from the host serial port being sent to all the clients in the address list. The remote port number is taken from S53. To avoid flooding the network, the packets are sent to each client with a 20ms pause in between. The receipt of UDP packets works as in normal UDP mode (i.e. bound by the value S53 and/or AIP). Since it may take a while to transmit the data to all hosts (especially if all 20 Modbus entries are used and name resolutions are required), new data received from the host port is buffered until current transmissions to all hosts are finished.

Enter the list of target IPs in the address list (ADDR LIST). The index numbers in the list aren't used. Configure for a normal UDP session. Set the Startup Mode Default to 83 (ATMD83). Configure the Destination port to match the device port of the remote modems.

TCP and TCP Pad

When the PinPoint X is in a TCP session, all characters received on the serial port are assembled into TCP packets and sent to the mode's remote IP address/port, and any packets received from the remote end of the TCP connection are disassembled and dumped onto the serial line.

A TCP connection is established by one of the following methods:

- Using the Dial TCP (DT) AT command. For example, **ATDT192.168.3.23/3456**.
- TCP auto answer is enabled (**S1**), a TCP connection request is received, and the modem is not in a data session.
- Data is received on the serial port and
  - The Startup Mode Default (**MD**) is *4* (auto TCP)
  - The remote TCP destination, as defined in S53, successfully responds to the TCP connection request.

The value of **S7** (TCP Connection Time-out) specifies the number of seconds to wait, after initiating a TCP connection attempt, for a successful connection to be established. If the connection has not been successfully established before the time-out occurs, ERROR/BUSY is returned.

TCP packet assembly is affected by the values of **S50** (PAD Forwarding Time-out) and **S51** (PAD Forwarding Character). Data received in the serial buffer will be transmitted when the idle inter-character time-out specified in S50 (in tenths of seconds) occurs or when a character is received that matches **S51** (if non-zero).

The TCP session will be terminated if no data is transmitted or received for the time interval specified in **TCPT** and **TCPS**. TCPT is the number of minutes (TCPS=0) or seconds (TCPS=1) used for this idle time-out.

Caution: *TCPT should never be 0 when using the TCP mode. A broken TCP session can result in the modem being left with a TCP half-open connection that can only be terminated with a reset.*

TCP Auto Answer

TCP auto answer (S0=1|2) also allows a TCP connection request to be "answered" when the modem is idle, not in a data session. The TCP connection request's destination port has to match the modem's device port.

Note: UDP auto answer may also be set simultaneously with TCP auto answer. Then, when in the idle state, the modem will accept either a TCP connection request or UDP incoming packet, and enter a TCP or UDP session as appropriate.

Hybrid Modes

Hybrid modes are supported mainly for legacy implementations. Some previous hybrid modes (MD=5, 6) are no longer implemented as special, unique modes. Now that UDP auto answer (UDP Half-open, S82=2) can be enabled in conjunction with UDP PAD mode (MD3), effectively this is the same as MD5 and MD6 previously accomplished. Setting MD5 and MD6 are still supported, but not recommended.

AT Command	Hybrid Mod (MD5)	Hybrid Mode2 (MD6)
MD	3	3
S82	2	2
S0	1	1
***UDPLAST**	0	1

Data Communication

Note: The PinPoint X forwards messages to and from the cellular network for only ONE device per port. The PinPoint X is a one-to-one gateway and does not have advanced routing features required to do one-to-many routing.

The primary purpose of the PinPoint X is to forward data from a single device connected to one of the ports to the cellular network and, ultimately, under most circumstances, to the Internet in a **one-to-one** gateway configuration.

When the PinPoint X obtains its IP address from AT&T, it also obtains the network routing information necessary to forward messages to their routers which can then forward on from there. The PinPoint X then acts as a router for the device connected to it, forwarding to or from the cellular network.

Note: If you have a device connected to the Ethernet port and the serial port, and the USB port, they will not be able to communicate to each other. Each port is routed separately to the cellular network with one-to-one routing for each.

Public and Private Mode

In Public Mode, the PinPoint X will pass the IP address assigned by the cellular network to the device connected to its port. Public Mode is the default mode for the PinPoint X.

If you need more control over which gateway address, device address, and netmask that is given out by the internal DHCP server, you can use the private host mode, *HOSTPRIVMODE, and set the internal network IP addresses. The PinPoint X will use NAT to forward packets to the end device.

Tip: *When using Public mode, Sierra Wireless recommends connecting the modem directly to the computer or other end device. Using a hub or switch may prevent the PinPoint X from updating the IP address of the end device when an IP address is received from the cellular network.*

In AceManager, the Private mode settings are part of the **PPP/ Ethernet** group.

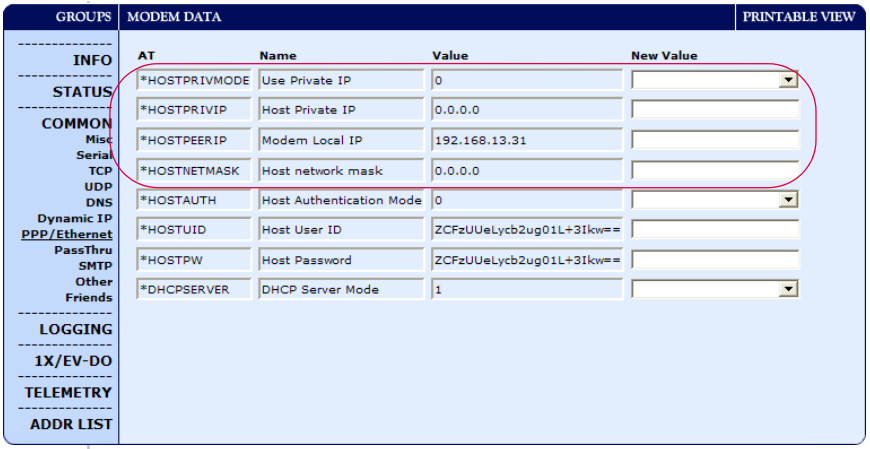


Figure 8-6: AceManager : PPP/Ethernet

- ***HOSTPRIVMODE** - Set to 1 to enable the explicit IP addresses.
- ***HOSTPRIVIP** - Set to the IP address you want the PinPoint X to give to your device.
- ***HOSTPEERIP** - Set to the IP address you want for the PinPoint X.
- ***HOSTNETMASK** - Set to the subnetmask, generally 255.255.255.0.

Tip: *If you are using Private Mode (*HOSTPRIVMODE=1), you will need to make sure that *HOSTPRIVIP and *HOSTPEERIP are on the same subnet. If the subnet mask is 255.255.255.0, it is safe to use 192.168.x.y for each as long as the x is the same number (0 in the example screen shot above) and the y is different (1 and 2 in the example) and between 0 and 254.*

Note: Regardless if the PinPoint X is configured for Public Mode or Private Mode, the same IP address will be given to all devices connected to any of the ports. While you can connect with each to the cellular network and the Internet, you cannot use the PinPoint X as a hub or router to communicate between them.

Internal DHCP Server

DHCP (Dynamic Host Configuration Protocol) has become a primary component of today's network environments. DHCP allows one server to automatically and dynamically allocate network IP addresses and other network related settings (such

as subnet masks, routers, etc.) to each computer or device without the need to set up each specifically or keep track of what addresses have already been used.

In a default configuration, the PinPoint X acts as a DHCP host to any device connected to its ports, providing that device with an IP address which can be used to communicate on the Internet. In Public Mode, that will be the IP address assigned by the cellular network. In Private Mode, that will be the IP address defined in *HOSTPRIVIP.

1. When the PinPoint X registers on the cellular network, it is assigned an IP address from AT&T, let's say A.B.C.D.
2. Acting as a DHCP server, in Public Mode, when the PinPoint X receives a DHCP request from an Ethernet device, it hands off the assigned address to the device and sets up the default gateway address as A.B.C.1. If the fourth octet is already a 1, it assigns A.B.C.2 as the router address.
3. The PinPoint X also sends a /24 netmask (255.255.255.0 by default) and sets up a static route which maps 192.168.13.31 (or the address configured with *HOSTPEERIP if it is changed) to A.B.C.1 (or A.B.C.2 if that was what the gateway address was given as).

Tip: *When PPPoE is used with the PinPoint X, DHCP is not needed. A tunnel is set up connecting a device (such as your computer or a router) with the modem. The device will then simply use the MAC address of the PinPoint X to send all outgoing packets.*

Keepalive

Keepalive is used to test the connection to the cellular network by pinging an IP address after a specified period of inactivity. Keepalive is only recommended for users who have a remote terminated modem that infrequently communicates to the network or if you have experienced issues over time where the modem can no longer be reached remotely.

When Keepalive pings the IP address, an acknowledgement indicates there is an active connection to the network. If the PinPoint X does not receive a response from the IP address, it will make additional attempts according to a backoff algorithm before determining the Internet connection is not functioning properly. If it determines the connection is not functioning, the modem will then attempt to reconnect to AT&T to reestablish IP connectivity.

Configuring Keepalive

In AceManager, the Keepalive settings are part of the *Other* group.

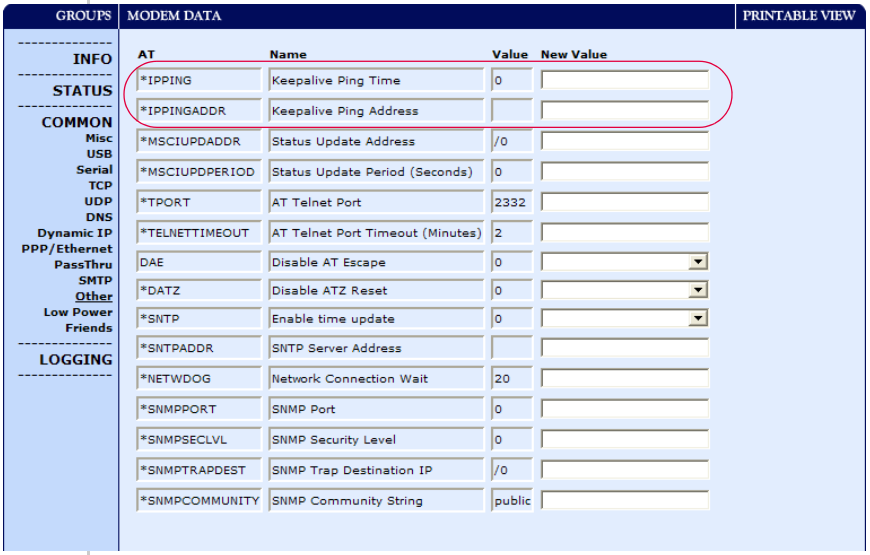


Figure 8-7: AceManager : Other

- ***IPPING** sets the interval, in minutes, you want Keepalive to test the network connection. To disable Keepalive, set *IPPING to 0 (default setting).

*Note: 15 minutes is the minimum time which can be set for Keepalive. If you set *IPPING for a value less than the minimum, the minimum value will be set.*

- ***IPPINGADDR** sets the IP address you want to use for the connection test.

Caution: *If *IPPINGADDR is left blank or is set to an invalid IP address (example, an IP which is unreachable or one which is not a valid IP address), modem performance will be adversely affected.*

Data usage using Keepalive

Keepalive is an optional feature. If you frequently pass data with your modem, you most likely do not need to have Keepalive enabled. When using Keepalive, be aware that a ping moves approximately 66 bytes of data over the network and is billable by AT&T. The following *IPPING settings will incur approximate monthly data usage in addition to any other data usage:

*IPPING	Estimated Usage
15 minutes	400k / month
30 minutes	200k / month
60 minutes	100k / month
120 minutes	50k / month

9: IP Manager

- Understanding Domain Names
- Using IP Manager with your PinPoint X
- Understanding DNS

If you have a fleet of Sierra Wireless AirLink modems or even if you only have one, it can be difficult to keep track of the current IP addresses, especially if the addresses aren't static but change every time the modems connect to Provider. If you need to connect to a modem, or the device behind it, it is so much easier when you have a domain name (car54.mydomain.com, where are you?).

Reasons to contact the modem and/or the connected device:

- Requesting a location update from a delivery truck.
- Contacting a surveillance camera to download logs or survey a specific area.
- An oil derek that needs to be triggered to begin pumping.
- Sending text to be displayed by a road sign.
- Updating the songs to be played on a juke box.
- Updating advertisements to be displayed in a cab.
- Remote access to a computer, a PLC, an RTU, or other system.
- Monitoring and troubleshooting the status of the modem itself without needing to bring it in or go out to it.

A dynamic IP address is suitable for many Internet activities such as web browsing, looking up data on another computer system, data only being sent out, or data only being received after an initial request (also called Mobile Originated). However, if you need to contact PinPoint X directly, a device connected to the modem, or a host system using your PinPoint X (also called Mobile Terminated), a dynamic IP won't give you a reliable address to contact (since it may have changed since the last time it was assigned).

Domain names are often only connected to static IP addresses because of the way most domain name (DNS) servers are set-up. Dynamic DNS servers require notification of IP Address changes so they can update their DNS records and link a dynamic IP address to the correct name.

- Dynamic IP addresses are granted only when your PinPoint X is connected and can change each time the modem reconnects to the network.
- Static IP addresses are granted the same address every time your PinPoint X is connected and are not in use when your modem is not connected.

Since many cellular providers, like wire-based ISPs, do not offer static IP addresses or static address accounts cost a premium vs. dynamic accounts, Sierra Wireless AirLink Solutions developed IP Manager to work with a Dynamic DNS server to receive notification from Sierra Wireless AirLink modems to translate the modem's dynamic IP address to a fully qualified domain name. Thus, you can contact your PinPoint X directly from the Internet using a domain name.

Understanding Domain Names

A domain name is a name of a server or device on the Internet which is associated with an IP address. Similar to how the street address of your house is one way to contact you and your phone number is another, both the IP address and the domain name can be used to contact a server or device on the Internet. While contacting you at your house address or with your phone number employ different methods, using a domain name instead of the IP address actually uses the same method, just a word based name is commonly easier to remember for most people than a string of numbers.

Understanding the parts of a domain name can help to understand how IP Manager works and what you need to be able to configure the modem. A fully qualified domain name (FQDN) generally has several parts.

- **Top Level Domain** (TLD): The TLD is the ending suffix for a domain name (.com, .net, .org, etc.)
- **Country Code Top Level Domain** (ccTLD): This suffix is often used after the TLD for most countries except the US (.ca, .uk, .au, etc.)
- **Domain name**: This is the name registered with ICANN (Internet Corporation for Assigned Names and Numbers) or the registry for a the country of the ccTLD (i.e. if a domain is part of the .ca TLD, it would be registered with the Canadian domain registry). It is necessary to have a name registered before it can be used.
- **Sub-domain or server name**: A domain name can have many sub-domain or server names associated with it. Sub-domains need to be registered with the domain, but do not

need to be registered with ICANN or any other registry. It is the responsibility of a domain to keep track of its own subs.

car54.mydomain.com

- ***.com*** is the TLD
- *mydomain* is the domain (usually noted as mydomain.com since the domain is specific to the TLD)
- *car54* is the subdomain or server name associated with the device, computer, or modem registered with mydomain.com

car54.mydomain.com.ca

This would be the same as above, but with the addition of the country code. In this example, the country code (.ca) is for Canada.

Tip: *A URL (Universal Resource Locator) is different from a domain name in that it also indicates information on the protocol used by a web browser to contact that address, such as* http:// www.sierrawireless.com. www.sierrawireless.com *is a fully qualified domain name, but the http://, the protocol identifier, is what makes the whole thing a URL.*

Dynamic Names

When an IP address is not expected to change, the DNS server can indicate to all queries that the address can be cached and not looked up for a long period of time. Dynamic DNS servers, conversely, have a short caching period for the domain information to prevent other Internet sites or queries from using the old information. Since the IP address of a modem with a dynamic account can change frequently, if the old information was used (such as with a DNS server which indicates the address can be cached for a long period of time) when the IP address changed, the domain would no longer point to the new and correct IP address of the modem.

If your PinPoint X is configured for Dynamic IP, when it first connects to the Internet, it sends a IP change notification to IP Manager. IP Manger will acknowledge the change and update the Dynamic DNS server. The new IP address will then be the address for your modem's configured name.

Once your modem's IP address has been updated in IP Manager, it can be contacted via name. If the IP address is needed, you can use the domain name to determine the IP address.

Note: The fully qualified domain name of your PinPoint X will be a subdomain of the domain used by the IP Manager server.

Using IP Manager with your PinPoint X

To allow your Sierra Wireless AirLink modem to be addressed by name, the modem needs to have a minimum of three elements configured. You can also configure a second dynamic server as a backup, secondary, or alternate server.

In AceManager, select *Dynamic IP*.

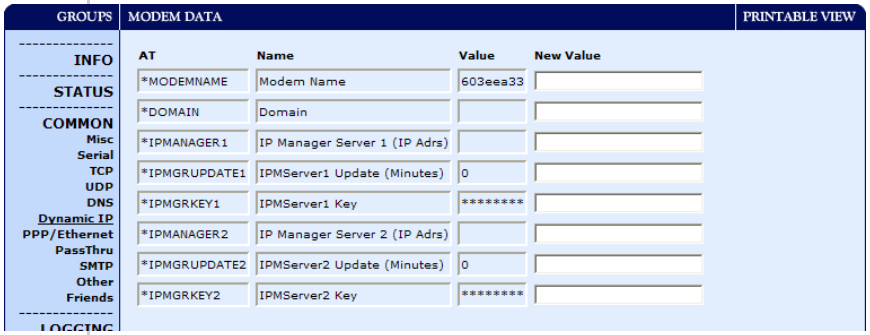


Figure 9-1: AceManager: Dynamic IP

- ***MODEMNAME** : The name you want for the modem. There are some restrictions listed below for the modem name.
- ***DOMAIN** : The domain name to be used by the modem. This is the domain name of the server configured for *IPMANAGER1.
- ***IPMANAGER1** : The IP address or domain name of the dynamic DNS server which is running IP Manager.
- ***IPMANAGER2** : The secondary server for the domain. While it is optional to have two servers configured, it is highly recommended.

Tip: *You can use a domain name instead of the IP address for your IP Manager servers if you have DNS set up in your PinPoint X.*

- ***IPMGRUPDATE1** and ***IPMGRUPDATE2**: How often, in minutes, you want the address sent to IP Manager. If this is set to zero, the modem will only send an update if

the IP address changes (example, if your PinPoint X is reset or is assigned a different IP address).

- ***IPMGRKEY1** and ***IPMGRKEY2**: User defined password key which is used instead of AirLink secret key when using an IP Manager server other than the one provided by Sierra Wireless.

Restrictions for Modem Name

For the Modem Name, you should use something which is unique but also easy to remember. Your company name or the intended function of the modem are recommended. If you have more than one modem and want to name them the same, you can append a number for each. Since it is an Internet domain name, there are some restrictions for the name.

- Must begin with a letter or number
- Can include a hyphen (-)
- Cannot contain spaces
- Must be no longer than 20 characters total

Data Usage for IP Manager Server Updates

The IP Manager update is a small packet sent to the server with a response sent back to the modem. If you have *IPMGRUPDATE1 or *IPMGRUPDATE2 set to any number but zero, the modem will send the update not only when it receives a new IP address but at the time interval as well. The data traffic could be billed by your carrier.

Each update is a total of 68 bytes from the modem with a 50 byte total response from the server for a round trip update of 118 bytes.

interval (minutes)	total bytes per day (24 hours)
10	16992 bytes
30	5664 bytes
60	2832 bytes
500	339.84 bytes

Eairlink.com

As a service, Sierra Wireless maintains a IP Manager servers which can be used for any AirLink modem.

Note: The IP Manager service from Sierra Wireless is currently not a guaranteed service though every effort is made to keep it operational 24/7.

- ***DOMAIN** : eairlink.com
- ***IPMANAGER**1 : edns2.eairlink.com
- ***IPMANAGER2** : eairlink.com

Tip: *When using the IP Manager service offered by Sierra Wireless, since there are many modems using the service, it is even more imperative to have a unique name for your modem.*

Understanding DNS

The PinPoint X has the ability to query DNS servers in order to translate domain names into IP addresses. This allows you to use domain names in place of IP addresses for most of the configuration options requiring IP addresses. This is important if your PinPoint X will need to contact another modem or other device that has a domain name but an unknown or dynamic IP address (such as another remote PinPoint X using IP Manager).

Configuring DNS

Generally, when your PinPoint X receives its IP address from Provider as part of the connection process, it will also receive the DNS servers to use for resolving (or translating) names to IP addresses which it will automatically configure in the modem settings. Unless your PinPoint X will be used on a network with other modems or devices which have names internal to the local network or frequently changing IP addresses, the DNS servers provided by Provider should be all you need.

If the PinPoint X will be communicating with a device that has a domain name but changes its IP address frequently (such as another AirLink modem using IP Manager) or is on a network where devices are accessed by names rather than IP addresses, you will want to put in an alternate DNS (*DNSUSER) where that domain is updated, such as the IP Manager server the remote modem is using or the listing of IP addresses to names is kept.

If you need to manually configure DNS, in AceManager, select *DNS*.

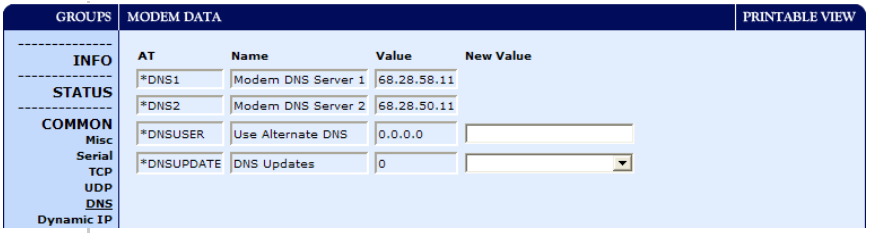


Figure 9-2: AceManager: DNS

- ***DNS1** and ***DNS2** - The primary and secondary DNS servers set by Provider when your PinPoint X gets its IP address.
- ***DNSUSER** - Set this, if desired, to an additional DNS server to query first before the primary or secondary (just as a hosts file is queried first on a computer). If *DNSUSER is set to 0.0.0.0, it will be ignored.
- ***DNSUPDATE** - This command sets how often you want DNS Updates to be requested. Otherwise the PinPoint X will only send updates when it is reset, powered up, or the IP address is granted by network changes.

The "PPP-Peer" Domain Name

The PinPoint X uses the unqualified domain name of "ppp-peer" when it is in PPP or SLIP address mode to resolve the address of the device or computer connected via PPP or SLIP address. If the PinPoint X is not in PPP or SLIP address mode, "ppp-peer" will resolve to 0.0.0.0.

10: Global Positioning System (GPS)

- Configuring the PinPoint X for GPS
- RAP Configuration
- NMEA Configuration
- TAIP Emulation Configuration

The PinPoint X is equipped with a Global Positioning System receiver (GPS) to ascertain its position and track the movements of a vehicle or other devices which move. The PinPoint X relays the information of its location as well as other data for use with tracking applications.

Tracking Applications used with Sierra Wireless PinPoint line modems:

- Air-Trak
- Track Your Truck
- Track Star
- DeLorme Street Atlas USA
- Microsoft Streets and Trips
- CompassCom
- Zoll Data
- and many more...

GPS Overview

The Global Positioning System (GPS) is a satellite navigation system used for determining a location and providing a highly accurate time reference almost anywhere on Earth. The US military refers to GPS as Navigation Signal Timing and Ranging Global Positioning System (NAVSTAR GPS).

GPS consists of a “constellation” of at least 24 satellites in 6 orbital planes. Each satellite circles the Earth twice every day at an altitude of 20,200 kilometers (12,600 miles). Each satellite is equipped with an atomic clock and constantly broadcasts the time, according to its own clock, along with administrative information including the orbital elements of its motion, as determined by ground-based observatories.

A GPS receiver, such as the PinPoint X, requires signals from four or more satellites in order to determine its own latitude, longitude, and elevation. Using time synced to the satellite system, the receiver computes the distance to each satellite

from the difference between local time and the time the satellite signals were sent (this distance is called psuedoorange). The locations of the satellites are decoded from their radio signals and a database internal to the receiver. This process yields the location of the receiver. Getting positioning information from fewer than four satellites, using imprecise time, using satellites too closely positioned together, or using satellites too close to the Earth's curve will yield inaccurate data.

The GPS data is then transmitted to a central location which uses a tracking application to compile information about location, movement rates, and other pertinent data.

Note: Depending on the location of the satellites in relation to the modem's location and how many signals are being received, the PinPoint X may encounter "GPS drift". The PinPoint X may report it is in a location a few feet from its actual location because it does not employ differential GPS.

PinPoint X Supported Protocols

The PinPoint X supports three different GPS reporting protocols.

Remote Access Protocol (RAP)

The Remote Access Protocol (RAP) is a proprietary binary message format developed by Sierra Wireless AirLink Solutions. RAP was originally designed to work specifically with AirLink Tracking System (ATS), but other 3rd party applications have been developed to take advantage of the RAP messaging format.

In the original RAP, a PinPoint line modem uses the UDP (User Datagram Protocol) to communicate with the host server.

In RAP-based AVL, each PinPoint line device sends its command status and responses to the Host server and the Host sends commands to one or more PinPoint line devices. For reliability, the Host expects each command to be acknowledged within a time-out period. If the acknowledgement packet (ACK) is not received within the time-out period, the Host will retransmit the command.

The RAP messages are in Hex and are referred to by their message ID. Reports can include GPS data alone, as well as GPS data with the date and time, radio frequency data, and state changes of I/O as well as sending reports based on power states.

Examples of tracking applications using RAP:

- Air-Trak
- TrackStar
- CompassCom
- Zoll Data
- HTE
- Spillman
- and others...

National Marine Electronics Association (NMEA)

National Marine Electronics Association (NMEA) is a protocol by which marine instruments and most GPS receivers can communicate with each other. NMEA defines the format of many different GPS message (sentence) types, which are intended for use by navigational equipment.

Example of a tracking application using NMEA:

- Microsoft Streets and Trips

Tip: *For more information on the PinPoint X supported NMEA message formats, please refer to the Appendix.*

Trimble ASCII Interface Protocol (TAIP)

Trimble ASCII Interface Protocol (TAIP) is a digital communication interface based on printable ASCII characters over a serial data link. TAIP was designed specifically for vehicle tracking applications but has become common in a number of other applications, such as data terminals and portable computers, because of its ease of use.

Example of a tracking application using TAIP:

- DeLorme Street Atlas USA

Tip: *For more information on TAIP message formats, refer to the Appendix and to the Sierra Wireless MP 3G Modem TAIP Reference.*

Datum

The GPS datum is the method of ascertaining the position of the GPS device using a specific reference point location. The datum used can influence the accuracy of the GPS positioning.

In addition to different reporting protocols, the PinPoint X supports the most widely used GPS datum:

- WGS84

- NAD83
- NAD27

Before you Configure GPS

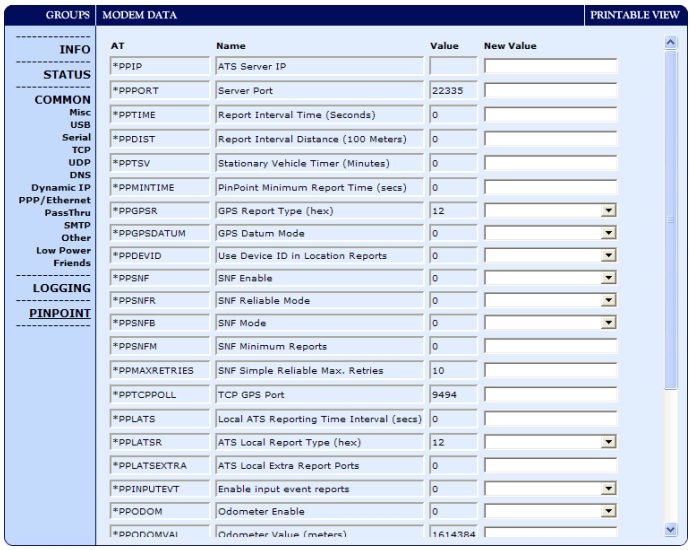
To decide what configuration you need for your PinPoint X, there are some fundamental considerations you should determine:

- **Protocol:** What is the GPS protocol used by your tracking application and what type of reports will you need?
- **Datum:** What is the datum supported by your tracking application?
- **Dynamic IP Address:** Will you need DNS support to handle a dynamic IP address account?

Configuring the PinPoint X for GPS

This section covers general configuration. Configurations for specific protocols are covered in later sections.

To configure your modem's GPS settings, you can use either AceManager or a terminal connection to configure the modem using AT commands. The configuration examples in this chapter all use AceManager. Most of the settings are in the group: *PinPoint*.



Tip: *You can use a fully qualified domain name instead of an IP address for most configuration options calling for an IP address if your PinPoint X is configured to use DNS. Refer to the IP Manager chapter for how to configure DNS and how to allow your PinPoint X use a domain name even with a dynamic IP address account from AT&T.*

Real-Time Clock Synchronization

Every hour, the PinPoint Xt will sync the internal Real Time Clock (RTC) with the Universal Time Coordinated (UTC) received from the GPS satellites.

Many tracking applications will translate the time reported by the PinPoint X as part of the GPS message to the appropriate local time zone using the UTC offset (i.e. California is UTC-8 and New York is UTC-5).

Tip: *AceManager displays the current time (UTC) set in the PinPoint X and does not translate it to the local time zone. If the PinPoint X is in California and it is 8 a.m., the modem's time will be shown as 4 p.m, since UTC is 8 hours "ahead" of Pacific time (UTC-8).*

Configuring the Datum

You can change the Datum used by your PinPoint X by configuring *PPGPSDATUM. Match the Datum to the Datum used by your tracking application.

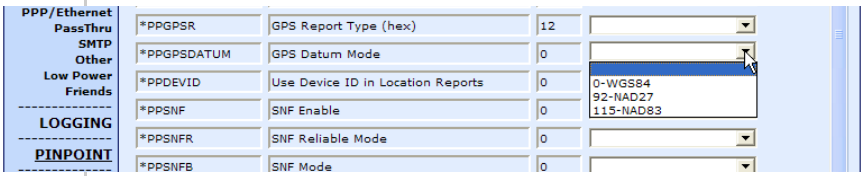


*Figure 10-1: AceManager : PinPoint - *PPGPSDATUM*

Over-The-Air (Remote) Host

To set the PinPoint X to report to an external or remote host, configure *PPIP (ATS Server IP) and *PPPORT (Server Port). *PPIP will work with any remote host.

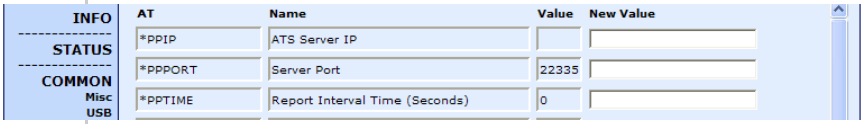


*Figure 10-2: AceManager : PinPoint - *PPIP/*PPPORT*

Local Host

To set the PinPoint X to report to a local host, one directly connected to the serial port, configure the port to be used with S53 - Destination Port. The local IP address will automatically be used for local reports. *S53*, in AceManager, is part of the *Misc* group.

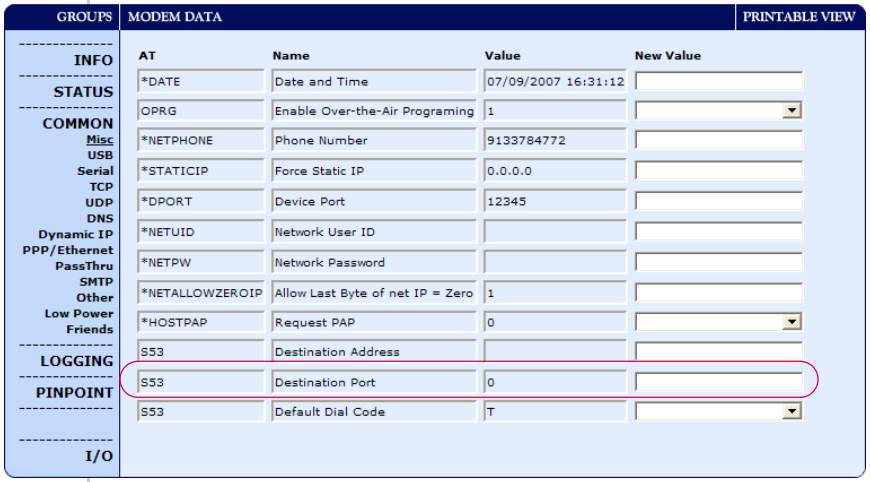


Figure 10-3: AceManager : Misc - S53 Port

If you need to send reports to additional local ports, you can specify other ports with **PPLATSEXTRA*. Local Reports can be sent to up to 7 additional ports consecutively following the S53 port. If S53=1000 and *PPLATSEXTRA=4, reports will be sent to 1000, 1001, 1002, 1003, and 1004. In PPLATSEXTRA, specify the number of ports where you want the reports sent, 0 to 7 (0 disables extra ports).

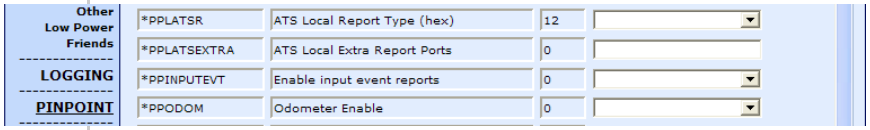


*Figure 10-4: AceManager : PinPoint - *PPLATSEXTRA*

TCP GPS Report Polling

The PinPoint X can easily and quickly be polled for location by opening a TCP connection to port 9494 (default). Once the connection is established, the PinPoint X will send a report with the current position using the GPS report type the modem is configured to use.

You can change the port for the TCP GPS poll using **PPTCPPOLL*.

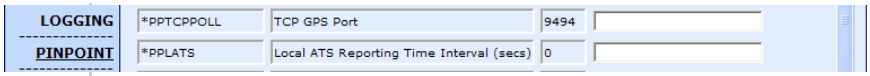


*Figure 10-5: AceManager : PinPoint - *PPTCPPOLL*

Note: Some Internet providers (including cellular) block ports below 1024.

Report Types

There are several report types available. For remote reports, set **PPGPSR*. For local reports, set **PPLATSR*.

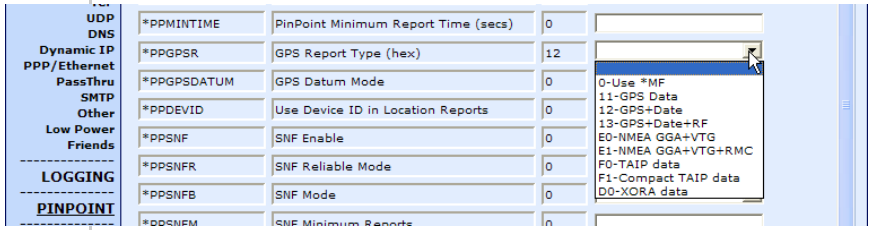


*Figure 10-6: AceManager : PinPoint - *PPGPRSR*

- **0** - *MF, Legacy reports for use with ATS version 4 and older.
- **11** - Global Positioning System (GPS) data.
- **12** - GPS data with the UTC time and date.
- **13** - GPS with time and date and Radio Frequency data from the antenna.
- **D0** - Xora reports.
- **E0** - NMEA GGA and VTG sentences.
- **E1** - NMEA GGA, RMC, and VTG sentences.
- **F0** - TAIP data
- **F1** - TAIP compact data

Tip: *The PinPoint X can be configured to supply one type of report to a remote host and a different report type locally through the serial port at same time. However, there may be conflicts due to the local and remote reporting being in different modes and not all features to both modes may be available.*

Sending Reports Automatically

Remote

You can configure the PinPoint X to send reports based on a time interval and on the movement of a vehicle (based on it's position from one time to the next).

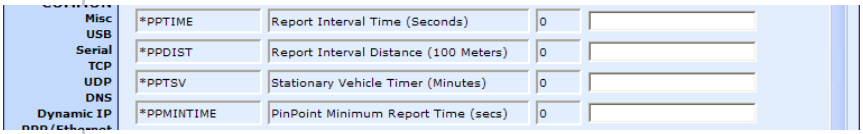


*Figure 10-7: AceManager : PinPoint - *PPTIME, *PPDIST, *PPTSV, *PPMINTIME*

- ***PPTIME** - Location report sent every set time interval (seconds).
- ***PPDIST** - Location report sent only if the position is more than the set distance (x 100 meters).
- ***PPTSV** - Location report sent if the vehicle has been in one location (stationary) for more than a set time interval (minutes).
- ***PPMINTIME** - Location report sent be sent at no less than this time interval (seconds).

Note: If you're implementing both a time interval and distance interval for reports, the PinPoint X will use the timer which expires first. The reporting interval can impact your data usage. If the interval is set frequently, you may want to have a high usage or unlimited data plan.

Tip: *One mile is approximately 1600 meters. 1000 meters is one kilometer.*

Local

If you are sending reports on the local serial port, and/or if you want them sent automatically, you will need to set **PPLATS*. The time interval, just as for *PPTIME, is in seconds.

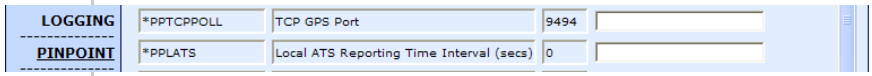


*Figure 10-8: AceManager : PinPoint - *PPLATS*

Report Delay on Power-Up

The PinPoint X can be configured to wait a specific amount of time after initialization before any reports are sent. Configure *#IG* for the desired wait in seconds.

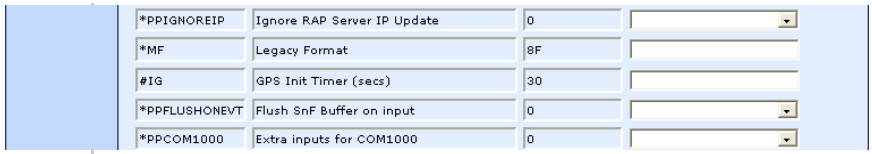


Figure 10-9: AceManager : PinPoint - #IG

Store and Forward

Store and Forward can provide seamless coverage even in areas with intermittent cellular coverage. If the PinPoint X leaves coverage or has very low signal (an RSSI of -105 or lower), it will store the GPS messages in memory. When the modem re-enters cellular coverage, it will then forward the messages as configured. The PinPoint X can also store messages and send them to the server in a packet rather than individually to conserve bandwidth.

Enable Store and Forward using **PPSNF*. You can also determine how you want the messages sent using **PPSNFB* and **PPSNFM*.

*Figure 10-10: AceManager : PinPoint - *PPSNF, *PPSNFB, *PPSNFM*

- **Normal** - Each report is sent immediately.
- **Polled** - Reports held until requested by the server.
- **Grouped** - Reports held until the total is equal or greater than **PPSNFM* which sets the packet size of grouped reports.

Store and Forward Reliable Mode

The Store and Forward Reliable Mode allows the PinPoint X to ensure all messages are received by the server even if the connection between them goes down for a period of time (such when a vehicle passes through a location where the cellular signal is weak or non-existent).

With Reliable Mode, **PPSNFR*, enabled, the PinPoint X will transmit a sequence number (1 to 127) as part of a packet of messages (may contain one or more reports). To reduce overhead, the server only acknowledges receipt of every eighth packet. The PinPoint X considers that 8 a “window” of outstanding packets.

If the PinPoint X doesn't receive acknowledgement for a "window", the modem will PING the server with a message containing the sequence numbers of the first and last packets that haven't been acknowledged. The PinPoint X will continue until the server acknowledges receipt. When the PinPoint X receives the acknowledgement, it will advance its "window" to the next group.

When the PinPoint X is first powered on (or reset), it will send a Set Window message to sync up with the server for the current "window".

On the other side, if the server receives an out of sequence packet, it will send a message to the modem noting the missing sequence and the PinPoint X will retransmit.

*Figure 10-11: AceManager : PinPoint - *PPSNFR, *PPMAXRETRIES*

Simple Reliable Mode will 'give up' after a configured number, **PPMAXRETRIES*, of attempts and discard messages that cannot be transmitted or received after that number of tries.

Sending Reports Based on an Interval

You can configure the PinPoint X to send reports based on a time interval and/or on the movement of a vehicle (based on it's position from one time to the next).

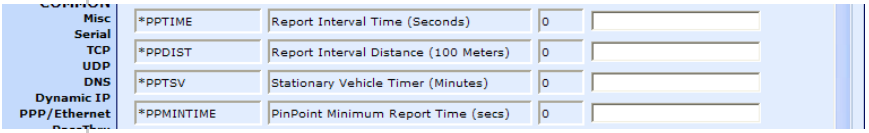


*Figure 10-12: AceManager : *PPTIME, *PPDIST, *PPTSV, *PPMINTIME*

- ***PPTIME** - Location report sent every set time interval (seconds).
- ***PPDIST** - Location report sent only if the position is more than the set distance (x 100 meters)
- ***PPTSV** - Location report sent if the vehicle has been in one location (stationary) for more than a set time interval (minutes).
- ***PPMINTIME** - Location report sent at no less than this time interval (seconds).

Flush on Event

If you have events enabled, with **PPFLUSHONEVT*, you can configure the PinPoint X to flush the SnF buffer when an event occurs. This will immediately send all pending SnF messages to the host. This allows an event, such as a vehicle being powered on or a tow bar activated, to be immediately sent, so its cause can be acted on without delay.

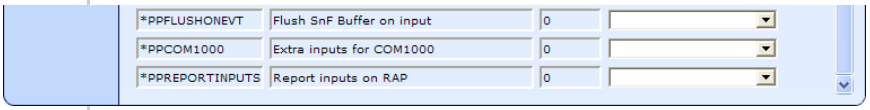


*Figure 10-13: AceManager : *PPFLUSHONEVT*

Note: Outstanding packets can include messages already sent to the server that haven't been acknowledged (SnF Reliable Mode) whether they have been received by the server or not.

RAP Configuration

RAP has additional features which allow reports based on external physical events, input from a 3rd party devices, store and forward processing, etc.

In addition to being able to configure your PinPoint X using AceManager or AT commands, most of the configuration settings for RAP can also be changed with the RAP configuration command message sent by the AVL host.

RAP Reports Over-The-Air (Remote)

To configure your PinPoint X to send RAP reports to a remote AVL host server, you will need to set 3 commands: **PPIP*, **PPPORT*, and **PPGPSR*.

a. Set the IP address of the host with **PPIP* and desired port on the host with **PPPORT*.

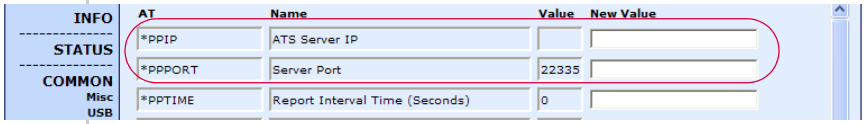


*Figure 10-14: AceManager : PinPoint - *PPIP, *PPPORT*

b. Set the GPS Report Type, using **PPGPSR*, to your preferred RAP report type.

11 - GPS - Global Positioning System data

12 - GPS + Date - GPS data with the UTC time and date

13 - GPS + Date + RF - GPS data with the UTC time and date and Radio Frequency information from the antenna.

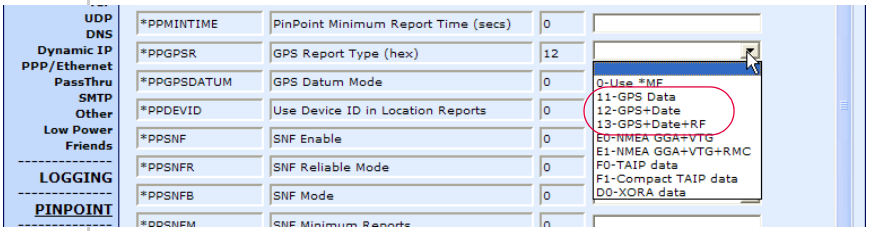


*Figure 10-15: AceManager : PinPoint - *PPGPSR*

Tip: *If your AVL host server uses a dynamic IP address or needs to change its IP address for any reason, you can use the RAP configuration command to change the value for *PPIP.*

RAP Reports over a Local Connection

Local reports are sent to the local IP address of the computer or device connected directly to a port on the PinPoint X. The reports are sent using PPP or SLIP for serial or USB virtual serial. To configure the modem to send reports to the local IP address, you will need to set 3 commands: *S53* in the Misc group and **PPLATS* and **PPLATSR* in the PinPoint group.

a. Set the *S53* port to the local port to which you want the reports sent. The local IP address will automatically be used.

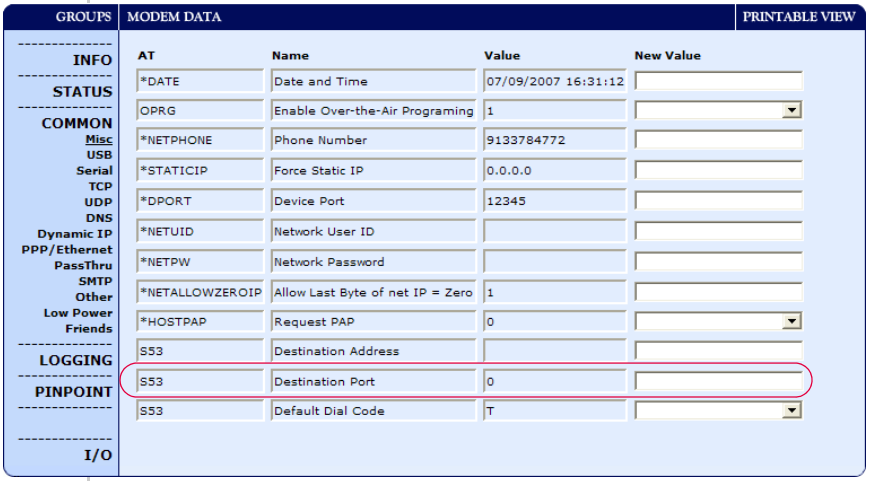


Figure 10-16: AceManager : Misc - S53

b. Set the Local Report Type, using **PPLATSR*, to your preferred RAP report type.

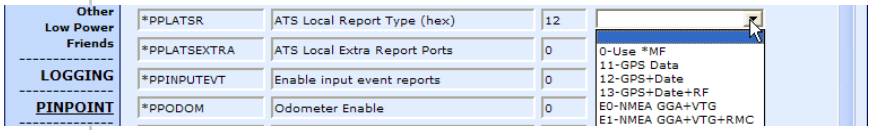


*Figure 10-17: AceManager : PinPoint - *PPLATSR*

11 - GPS - Global Positioning System data

12 - GPS + Date - GPS data with the UTC time and date

13 - GPS + Date + RF - GPS data with the UTC time and date and Radio Frequency information from the antenna.

c. Set Local Reporting Time Interval, using **PPLATS*, to the number of seconds you want as an interval between reports being sent.

Tip: *If *PPLATS is set to 0, reports will only be sent if a poll command is issued by the local client.*

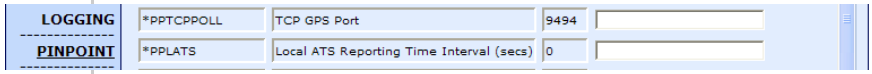


*Figure 10-18: AceManager : PinPoint - *PPLATS*

Configuring Additional RAP Features

RAP allows additional information to be sent with the reports to enable a richer tracking feature set.

Device ID

By enabling **PPDEVID*, a device ID of the PinPoint X is sent as part of the RAP message to make identification easier in a network or fleet of vehicles equipped with PinPoint line devices.

*Figure 10-19: AceManager : PinPoint - *PPDEVID*

With **PPDEVID* enabled, the PinPoint X will use the value configured for **NETPHONE* for the device ID. If **NETPHONE* is empty, the ESN of the modem will be used.

Tip: *If the PinPoint X is using a dynamic IP, *PPDEVID needs to be enabled.*

Odometer Data in Reports

When the odometer report is enabled, the PinPoint X will calculate distance between reports based on GPS data. The modem's odometer calculations can be included in the RAP message.

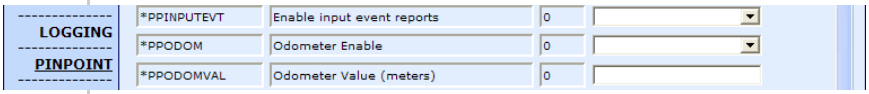


*Figure 10-20: AceManager : PinPoint - *PPODOM, *PPODOMVAL*

- **PPODOM* enables the odometer reporting.
- **PPODOMVAL* is the current odometer reading in the PinPoint X. You can set this to a number to offset the odometer calculation, such as one-time manual synchronization of the PinPoint X odometer with the current vehicle odometer.

Note: The odometer calculations of the PinPoint X may not match the odometer in the vehicle itself. The PinPoint X odometer is not connected to the vehicle's, it is entirely based on calculations of GPS readings.

I/O Event Reports

You can configure the PinPoint X to send reports to the AVL Host based on the state of the digital inputs.

Tip: *Setting up the I/O port hardware is covered in the Inputs, Relay Outputs, and Power Status chapter.*

Enable *PPINPUTEVT to have events sent to the Host server.

*Figure 10-21: AceManager : PinPoint - *PPINPUTEVT*

COM 1000 support

Support for a COM1000 is enable with the command *PPCOM1000=1 or *PPREPORTINPUTS=1. Once enabled, ALEOS will receive the reports from a properly configured COM1000 and add the state of the extra inputs to RAP packets sent to the RAP Host.

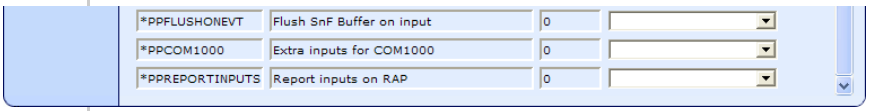


*Figure 10-22: AceManager : *PPCOM1000, *PPREPORTINPUTS*

If you are replacing an existing Pinpoint or PinPoint-E in a vehicle with a COM1000, simply replace earlier modem with the with the PinPoint. Turn on COM1000 reporting with the command *PPCOM1000=1 to allow a seamless transition with no need to change any commands to support the COM1000 in the same operation as the previous installation.

If you have a new vehicle installations for the PinPoint and have previously installed Pinpoints or PinPoint-E modems plus COMM1000 in other vehicles, connect the inputs directly to the PinPoint and turn on input reporting with the command *PPREPORTINPUTS=1. Since the PinPoint inputs report using the exact same bit fields as the COM1000, no changes to your software should be required.

Caution: *If both *PPCOM1000 and *PPREPORTINPUTS are enabled, the PinPoint X digital inputs will be reported and the COM1000 inputs will be ignored.*

The report type will indicate the state of change in the inputs. The contents of the report will be the same as Report Type 0x12 (GPS data with date) or 0x13 (GPS data with date and RF data) with the addition of the event report.

Flush on Event

If you have Store and Forward configured and enabled, to receive event reports immediately when they occur, you will want to enable **PPFLUSHONEVT*. This will cause all pending reports, including the triggering event, to be sent immediately to the Host.

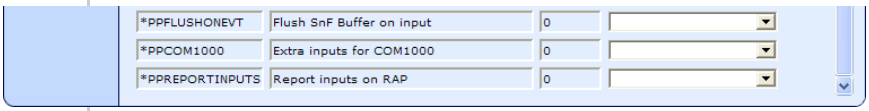


*Figure 10-23: AceManager : *PPFLUSHONEVT*

NMEA Configuration

Messages Over-The-Air (Remote)

To configure the PinPoint X to send NMEA reports to a remote server, you will need to set 3 commands: *PPIP, *PPPORT, and *PPGPSR.

a. Set **PPIP* and **PPPORT* to the IP address and port of the server to which you want the reports sent.

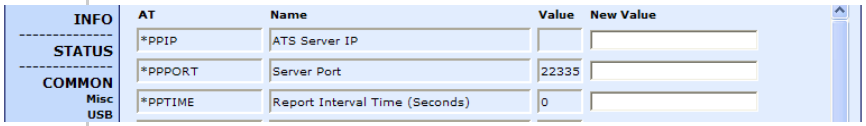


*Figure 10-24: AceManager : PinPoint - *PPIP/*PPPORT*

b. Set the GPS Report Type (*PPGPSR) to your preferred NMEA sentence format.

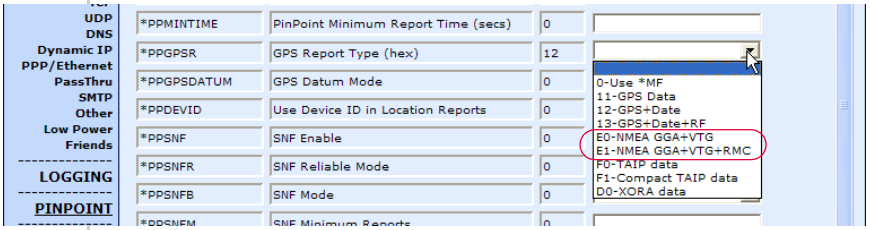


*Figure 10-25: AceManager : PinPoint - *PPGPRSR*

- **E0** - NMEA GGA and VTG sentences.
- **E1** - NMEA GGA, RMC, and VTG sentences.

Local Host

Local reports are sent to the local IP address of the computer or device connected to the serial port or USB port of the PinPoint X using PPP. To configure the modem to send to the local IP, you will need to set 3 commands: *S53, *PPLATS, and *PPLATSR.

a. Set the port (S53) to the local port to which you want the reports sent. The local IP address will automatically be used. *S53*, in AceManager, is part of the *Misc* group.

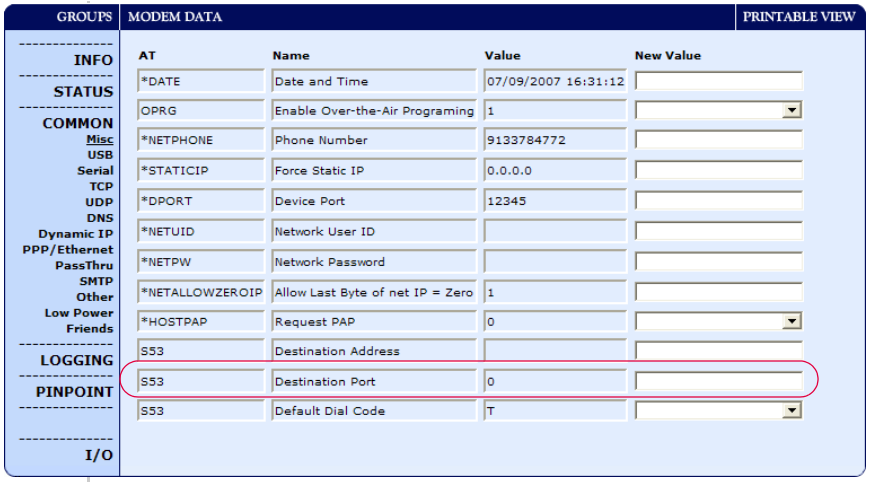


Figure 10-26: AceManager : Misc - S53 Port

b. Set the Local Report Type, **PPLATSR*, to your preferred NMEA sentence format.

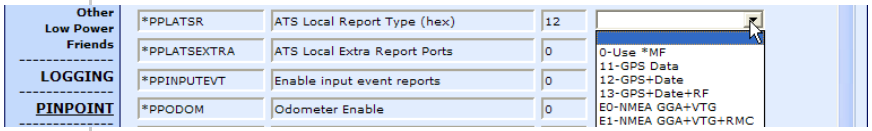


*Figure 10-27: AceManager : PinPoint - *PPLATSR*

- **E0** - NMEA GGA and VTG sentences.
- **E1** - NMEA GGA, RMC, and VTG sentences.

c. Set Local Reporting Time Interval, using **PPLATS*, to the number of seconds you want as an interval between reports being sent.

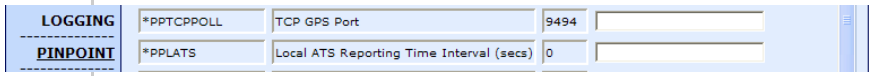


*Figure 10-28: AceManager : PinPoint - *PPLATS*

Streaming Messages (Local)

The PinPoint X can be configured to send standard NMEA messages (sentences) in ASCII over the serial port and/or USB port without a PPP connection to the local computer.

Send the command *ATGPS1* to the serial port, *ATGPS2* to the USB port, or *ATGPS3* for both to begin the NMEA stream. The example below shows the stream in HyperTerminal connecting directly to a PinPoint X via the comport and/or USB port. To stop the stream, with either terminal connection, use the command *ATGPS0* (this can be entered even while data is streaming).

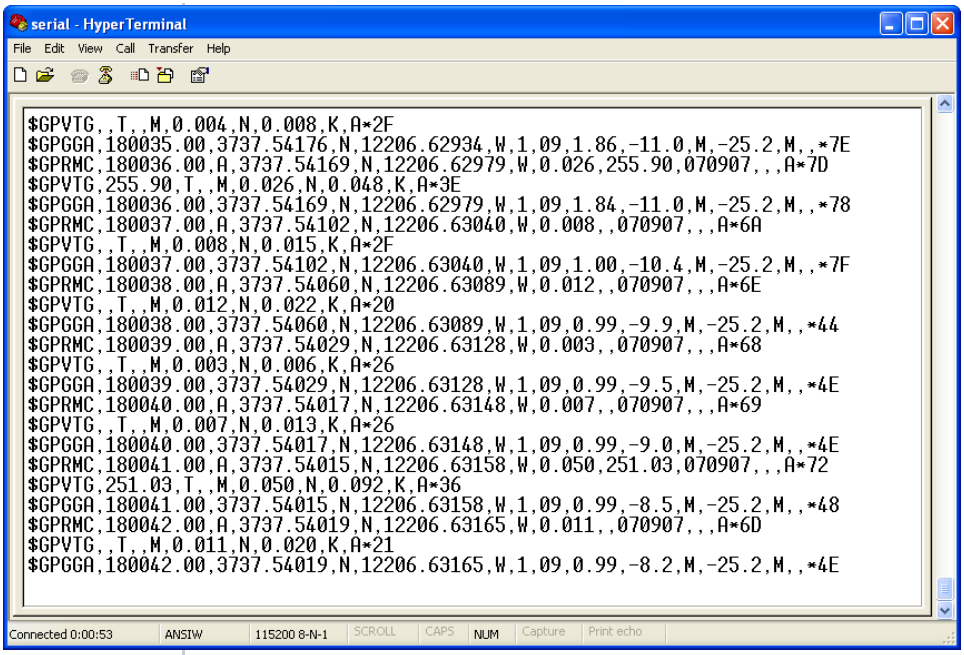


Figure 10-29: HyperTerminal : NMEA Streaming

Persistent Streaming

To have persistent streaming, allowing you to stream the data even after the modem is reset, configure **PGPS* and set **PGPSR* for NMEA.

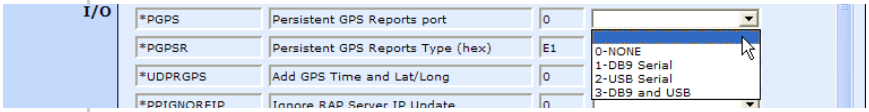


*Figure 10-30: AceManager : PinPoint - *PGPS*

- **0** - Disable NMEA streaming.
- **1** - Stream the NMEA strings out the serial port only.
- **2** - Stream the NMEA strings out the USB port only.
- **3** - Stream the NMEA strings out both the serial and the USB ports.

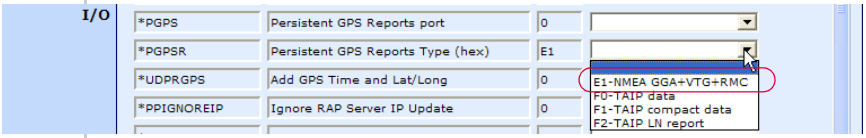


*Figure 10-31: AceManager : PinPoint - *GPSR*

- **E1** - NMEA GGA, RMC, and VTG sentences.

TAIP Emulation Configuration

The TAIP emulation functionality allows the PinPoint X to operate in a limited manner with clients which only understand the Trimble ASCII Interface Protocol (TAIP).This emulation is enabled by setting the GPS report format, directing the modem to listen for TAIP messages, and disabling RAP formatted messages to the same interface.

TAIP ID

TAIP messages can be configured to send the user specified identification number (ID). This greatly enhances the functional capability of the unit in a network environment. Set the ID using **PPTAIPID*.

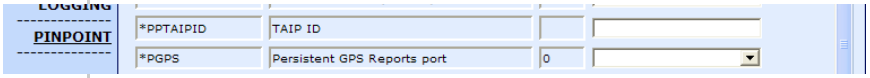


*Figure 10-32: AceManager : PinPoint - *PPTAIPID*

TAIP Command Emulation

With TAIP emulation, the PinPoint X will listen for TAIP messages on port 21000. Set the GPS Report Type, **PPGPSR*, to your preferred TAIP data format.

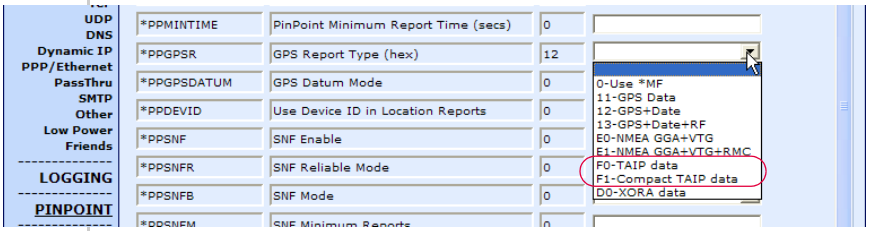


*Figure 10-33: AceManager : PinPoint - *PPGPRSR*

- **F0** - TAIP data (LN): latitude, longitude, altitude, the horizontal and vertical speed, and heading.
- **F1** - Compact TAIP data (PV): latitude/longitude, speed, and heading.

Caution: *When TAIP emulation is enabled, RAP will be disabled and no RAP messages or commands will be sent or received on that port.*

Supported TAIP Commands

The TAIP emulation will accept the following TAIP message types:

- **SRM** (Set Reporting Mode) allows the client to set the reporting mode configuration. The report mode configuration is not stored in non-volatile memory and such should be resent upon a unit reset. This behavior emulates that specified in TAIP specifications.
- **QRM** (Query Reporting Mode) reports the reporting mode configuration (returns an "RRM" message).
- **SID** (Set ID) allows the client to set the TAIP ID (AT*PPTAIPID can also be used to set the TAIP ID). The TAIP ID, when set with a "SID" message, will be written to non-volatile memory.
- **QID** (Query ID) reports the TAIP ID (returns an "RID" message).
- **DPV** configures automatic reporting of PV (Position/Velocity) reports based on distance traveled and a maximum time. The delta distance value specified in the message is converted to hundreds of meters and stored as *PPDIST. The maximum time interval is stored as *PPTIME. Currently the minimum time and epoch values are ignored.
- **FPV** configures periodic reporting of PV (Position/Velocity) reports. The time interval from the message is stored at *PPTIME. Currently the epoch value is ignored.
- **QPV** (Query Position Velocity) responds with a PV (Position/Velocity) report.

The TAIP emulation will generate the following reports corresponding to the appropriate event (either a query for it, echoed due to a set, or due to an automatic reporting event):

- **RRM** (Report Reporting Mode) reports the reporting mode configuration.
- **RID** (Report ID) reports the TAIP ID.
- **RPV** (Report Position/Velocity) reports Position/Velocity.

Messages Over-the-Air (Remote)

To configure the PinPoint X to send NMEA reports to a remote server, you will need to set 3 commands: *PPIP, *PPPORT, and *PPGPSR.

a. Set **PPIP* and **PPPORT* to the IP address and port of the server to which you want the reports sent.

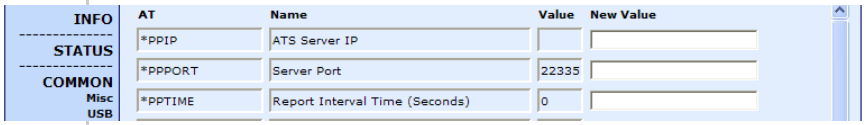


*Figure 10-34: AceManager : PinPoint - *PPIP/*PPPORT*

*Note: Unlike standard TAIP which simply sends to the last client to request automatic reports, the remote reports are sent to the destination address (*PPIP) and destination port (*PPPORT).*

b. Set the GPS Report Type, **PPGPSR*, to your preferred TAIP data format.

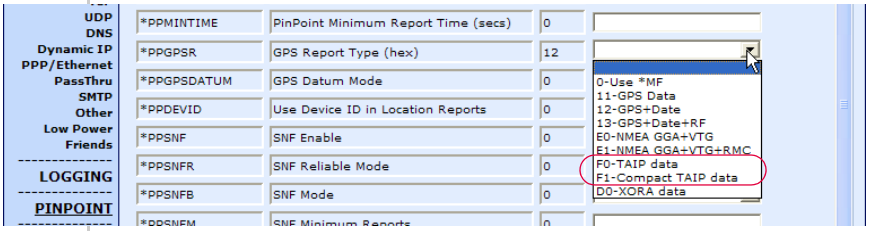


*Figure 10-35: AceManager : PinPoint - *PPGPRSR*

- **F0** - TAIP data (LN): latitude, longitude, altitude, the horizontal and vertical speed, and heading.
- **F1** - Compact TAIP data (PV): latitude/longitude, speed, and heading.

Local Connection

Some TAIP client applications can send TAIP requests and listen for reports using a local connection. Generally this is done over the serial port using PPP. This can also be done over the USB virtual serial port using PPP.

The PinPoint X will listen for TAIP requests on the local IP address and port. Once a TAIP request command has been received, the PinPoint Xt will begin issuing TAIP reports to the local IP address and port 21000. The client application should be listening for reports on this IP address and port. No unsolicited reports will be sent from the PinPoint to the local client application.

To configure this local TAIP reporting, you will need to set four commands: *PPIP, S53, *PPGPSR, and *PPLATS.

a. Set the port (S53) to the local port to which you want the reports sent, 21000 is the common setting. *S53*, in AceManager, is part of the *Misc* group.

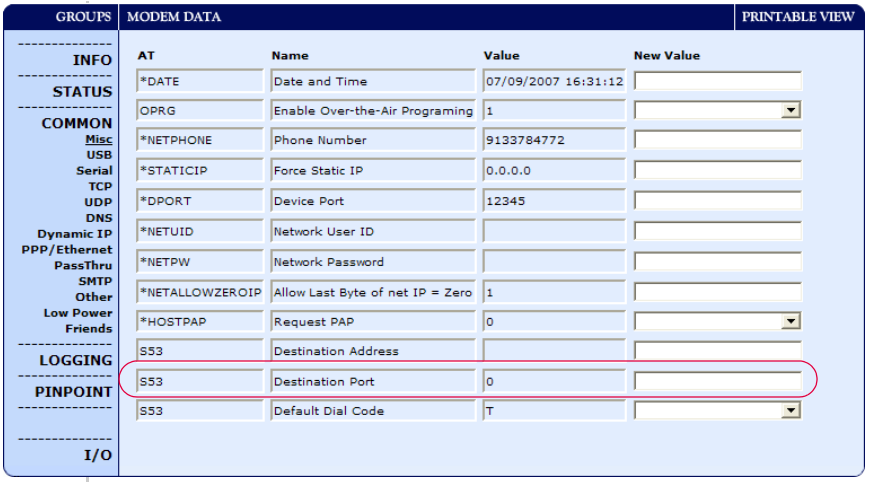


Figure 10-36: AceManager : Misc - S53 Port

b. Set **PPIP* to the local IP address of the PinPoint X. The default IP address of the PinPoint X 192.168.13.31.

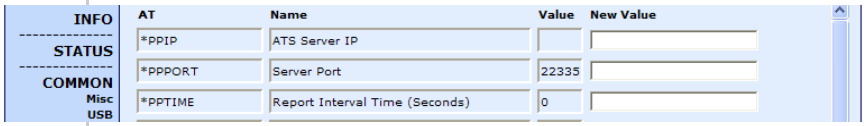


*Figure 10-37: AceManager : PinPoint - *PPIP*

c. Set Local Reporting Time Interval, using **PPLATS*, to the number of seconds you want as an interval between reports being sent.

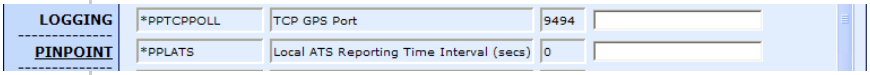


*Figure 10-38: AceManager : PinPoint - *PPLATS*

d. Set the GPS Report Type, **PPGPSR*, to your preferred TAIP data format.

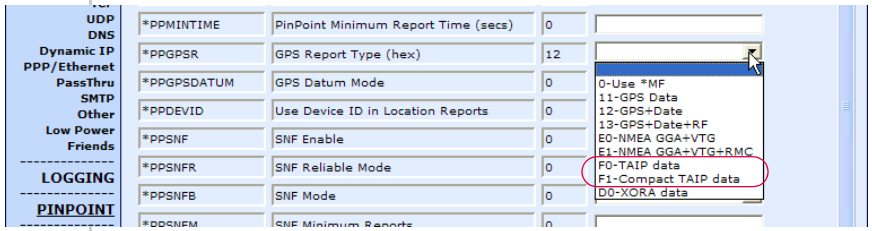


*Figure 10-39: AceManager : PinPoint - *PPGPRSR*

- **F0** - TAIP data (LN): latitude, longitude, altitude, the horizontal and vertical speed, and heading.
- **F1** - Compact TAIP data (PV): latitude/longitude, speed, and heading.

Sending Unsolicited TAIP Messages over the Local Connection

Standard TAIP requires a request before GPS reports are sent. The PinPoint X, however, can be configured to allow TAIP formatted messages to be sent over any UDP Port without request commands. This is useful for those applications which can listen for TAIP messages but cannot send UDP request packets.

a. Set the *S53* port to **1000**. The local IP address will automatically be used.

b. Set **PPLATSR*, Local Report Type, to **F0** or **F1**.

c. Set **PPLATS*, Local Reporting Time Interval, to **5** to send reports every 5 seconds (can be adjusted as circumstances warrant).

d.

Streaming Messages (Local)

The Product Name can be configured to send standard TAIP messages (sentences) in ASCII over the serial port and/or USB port without a PPP connection to the local computer.

Send the command ATGPS1 to the serial port, ATGPS2 to the USB port, or ATGPS3 for both to begin the TAIP stream. The example below shows the stream in HyperTerminal connecting directly to a Product Name via the comport and/or USB port. To stop the stream, with either terminal connection, use the command ATGPS0 (this can be entered even while data is streaming).

Persistent Streaming

To have persistent streaming, allowing you to stream the data even after the modem is reset, configure *PGPS and set *PGPSR for TAIP.

Avoir couler persistant, te permettant de couler les données même après que le modem est remis à zéro, configurent le *PGPS et *PGPSR.

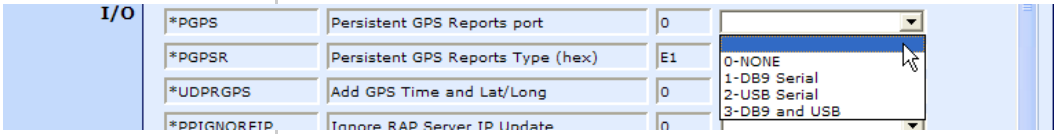


Figure 10-40: AceManager : PinPoint

- *PGPS

0 - Disable TAIP streaming.

1 - Stream the TAIP strings out the serial port only.

2 - Stream the TAIP strings out the USB port only.

3 - Stream the TAIP strings out both the serial and the USB ports.

0 - Neutralisez couler de TAIP.

1 - Coulent les cordes de TAIP hors de la porte série seulement.

2 - Coulent les cordes de TAIP hors du port d'USB seulement.

3 - Coulent les cordes de TAIP hors de la porte série et du port d'USB.

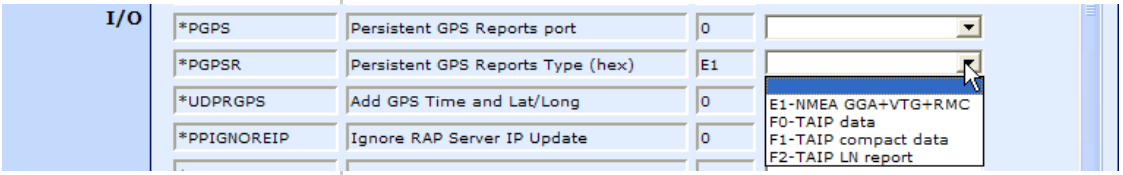


*Figure 10-41: AceManager : PinPoint - *GPSR*

E1 - TAIP GGA, RMC, and VTG sentences.

E1 - Phrases TAIP GGA, RMC et VTG.

11: SNMP : Simple Network Management Protocol

- SNMP Configuration
- SNMP MIB Definition Sample

The Simple Network Management Protocol (SNMP) was designed to allow remote management and monitoring of a variety of devices from a central location. The SNMP management system is generally composed of agents (such as your PinPoint X, a router, a UPS, a web server, a file server, or other computer equipment) and a Network Management Station (NMS) which monitors all the agents on a specific network. Using the management information base (MIB), an NMS can include reporting, network topology mapping, tools to allow traffic monitoring and trend analysis, and device monitoring.

Authentication ensures SNMP messages coming from the agent, such as the PinPoint X, have not been modified and the agent may not be queried by unauthorized users. SNMPv3 uses a User-Based Security Model (USM) to authenticate and, if desired or supported, message encryption. USM uses a user name and password specific to each device.

The PinPoint X can be configured as an SNMP agent and supports SNMPv2c and SNMPv3.

Management Information Base (MIB)

The management information base (MIB) is a type of database used to compile the information from the various SNMP agents. Reports from various agents, such as the PinPoint X, are sent as data in form designed to be parsed by the NMS into its MIB. The data is hierarchical with entries addressed through object identifiers.

SNMP Traps

SNMP traps are alerts that can be sent from the managed device to the Network Management Station when an event happens. Your PinPoint X is capable of sending the linkUp trap when the network connection becomes available.

SNMP Configuration

To configure your PinPoint X to work as an SNMP agent, you can use either AceManager, or a terminal connection to configure the modem using AT commands. In AceManager, the SNMP commands are all part of the **Other** group under the **Common** group.

There are only three commands to set for SNMP in the PinPoint X: the listening port, the security level, and the trap destination.

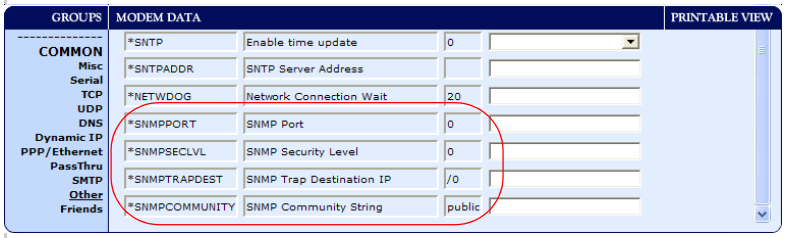


Figure 11-1: AceManager : Common > Other

Listening Port

*SNMPPORT sets the port for the SNMP agent to listen on. If set to zero, default, SNMP is disabled.

Tip: *SNMP generally uses port 161, however most Internet providers (including cellular) block all ports below 1024 as a security measure. You should be able to use a higher numbered port such as 10161.*

Security Level

*SNMPSECLVL sets the security level and which version of SNMP communications are used.

- **0** - No security required. SNMPv2c and SMNPv3 communications are allowed.
- **1** - Authentication required. SNMPv3 is required to do authentication and SNMPv2c transmissions will be silently discarded. Authentication is equivalent to the authNoPriv setting in SNMPv3.
- **2** - Authentication required and messages are encrypted. SNMPv3 is required to do authentication. SNMPv2c and SNMPv3 authNoPriv transmissions will be silently discarded. Authentication and encryption is equivalent to the authPriv setting in SNMPv3.

User Name and Password

The user name is '***user***'. The user name cannot be changed. The PinPoint X's password is used as the SNMP password (default is '***12345***').

Tip: *The eight-character password requirement for SMNPv3 is not enforced by the PinPoint X Agent to allow the default password to function. Your SNMP administrator or MIS may require you to change to a more secure and/or longer password.*

To change the password in the PinPoint X, select **Modem** from the top menu line in AceManager.

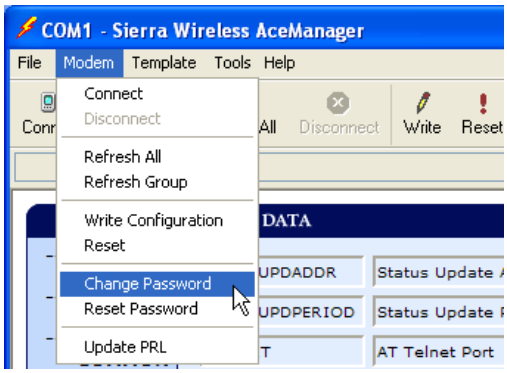


Figure 11-2: AceManager : Change Password menu option

The current password will be pre-entered. As you type the new password and confirm it, the characters you type will be obscured by "x". For the password, you can use numbers, letters, and/or punctuation.

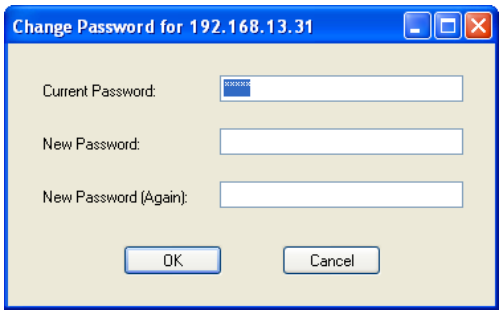


Figure 11-3: Change Password

Caution: *The password is case sensitive. "drowssaP" is not the same as "drowssap".*

Trap Destination

*SNMPTRAPDEST needs to be set with the destination IP and port. If either are set to zero or empty, SNMP traps are disabled.

Note: Traps are sent out according to the SNMP security level (i.e. if the security level is 2, traps will be authenticated and encrypted). Currently, the only trap supported is LinkUp.

Community String

The community string can be configured using *SNMPCOMMUNITY. The default is "public".

SNMP MIB Definition Sample

```
AIRLINK-MIB DEFINITIONS ::= BEGIN

IMPORTS
ObjectName FROM SNMPv2-SMI
MODULE-COMPLIANCE FROM SNMPv2-CONF;

org OBJECT IDENTIFIER ::= { iso 3 }
dod OBJECT IDENTIFIER ::= { org 6 }
internet OBJECT IDENTIFIER ::= { dod 1 }
private OBJECT IDENTIFIER ::= { internet 4 }
enterprises OBJECT IDENTIFIER ::= { private 1 }

airlink OBJECT IDENTIFIER ::= { enterprises 20542 }
general OBJECT IDENTIFIER ::= { airlink 1 }
common OBJECT IDENTIFIER ::= { airlink 2 }
status OBJECT IDENTIFIER ::= { airlink 3 }
gps OBJECT IDENTIFIER ::= { airlink 4 }

-- GENERAL --
phoneNumber OBJECT-TYPE
SYNTAX DisplayString (SIZE (10))
MAX-ACCESS read-only
STATUS current
   ::= { general 1 }

deviceID OBJECT-TYPE
SYNTAX DisplayString
MAX-ACCESS read-only
STATUS  current
   ::= { general 2 }
```

```
electronicID OBJECT-TYPE
SYNTAX  DisplayString
MAX-ACCESS  read-only
STATUS current
   ::= { general 3 }

modemType OBJECT-TYPE
SYNTAX  DisplayString
MAX-ACCESS read-only
STATUS current
   ::= { general 4 }

aleosSWVer OBJECT-TYPE
SYNTAX  DisplayString
MAX-ACCESS  read-only
STATUS current
   ::= { general 5 }

aleosHWVer OBJECT-TYPE
SYNTAX  DisplayString
MAX-ACCESS  read-only
STATUS  current
   ::= { general 6 }

modemSWVer OBJECT-TYPE
SYNTAX   DisplayString
MAX-ACCESS  read-only
STATUS  current
   ::= { general 7 }

modemHWVer OBJECT-TYPE
SYNTAX   DisplayString
MAX-ACCESS  read-only
STATUS  current
   ::= { general 8 }

-- COMMON --
date OBJECT-TYPE
SYNTAX  DisplayString
MAX-ACCESS  read-only
STATUS  current
   ::= { common 1 }

otaProgrammingEnable OBJECT-TYPE
SYNTAX  INTEGER {
disabled(0),
enabled(1) }
MAX-ACCESS  read-only
```

```
STATUS current
  ::= { common 2 }

devicePort OBJECT-TYPE
SYNTAX INTEGER(0..65535)
MAX-ACCESS read-only
STATUS current
  ::= { common 3 }

netUID OBJECT-TYPE
SYNTAX DisplayString
MAX-ACCESS read-only
STATUS current
  ::= { common 4 }

netPW OBJECT-TYPE
SYNTAX DisplayString
MAX-ACCESS read-only
STATUS current
  ::= { common 5 }

requestPAP OBJECT-TYPE
SYNTAX INTEGER {
no(0),
yes(1) }
MAX-ACCESS read-only
STATUS current
  ::= { common 6 }

destinationAddress OBJECT-TYPE
SYNTAX DisplayString
MAX-ACCESS read-only
STATUS current
  ::= { common 7 }

destinationPort OBJECT-TYPE
SYNTAX INTEGER(0..65535)
MAX-ACCESS read-only
STATUS current
  ::= { common 8 }

serialPortSettings OBJECT-TYPE
SYNTAX DisplayString
MAX-ACCESS read-only
STATUS current
  ::= { common 9 }

serialPortFlowControl OBJECT-TYPE
SYNTAX INTEGER {
```

```
none(0),
hardware(2),
software(4) }
MAX-ACCESS  read-only
STATUS  current
   ::= { common 10 }

-- STATUS --
ipAddress OBJECT-TYPE
SYNTAX IpAddress
MAX-ACCESS  read-only
STATUS  current
   ::= { status 1 }

netState OBJECT-TYPE
SYNTAX DisplayString
MAX-ACCESS  read-only
STATUS  current
   ::= { status 2 }

netChannel OBJECT-TYPE
SYNTAX  INTEGER
MAX-ACCESS  read-only
STATUS  current
   ::= { status 3 }

rssi OBJECT-TYPE
SYNTAX   INTEGER(-125..-50)
MAX-ACCESS  read-only
STATUS current
    ::= { status 4 }

serialSent OBJECT-TYPE
SYNTAX  INTEGER
MAX-ACCESS  read-only
STATUS  current
   ::= { status 5 }

serialReceived OBJECT-TYPE
SYNTAX  INTEGER
MAX-ACCESS  read-only
STATUS   current
   ::= { status 6 }

hostMode OBJECT-TYPE
SYNTAX  DisplayString
MAX-ACCESS  read-only
STATUS  current
   ::= { status 7 }
```

```
powerMode OBJECT-TYPE
SYNTAX  DisplayString
MAX-ACCESS  read-only
STATUS  current
  ::= { status 8 }

fixObtained OBJECT-TYPE
SYNTAX  INTEGER {
no(0),
yes(1) }
MAX-ACCESS  read-only
STATUS  current
  ::= { gps 1 }

satelliteCount OBJECT-TYPE
SYNTAX  INTEGER
MAX-ACCESS  read-only
STATUS current
::= { gps 2 }

latitude OBJECT-TYPE
SYNTAX  DisplayString
MAX-ACCESS  read-only
STATUS  current
::= { gps 3 }

longitude OBJECT-TYPE
SYNTAX  DisplayString
MAX-ACCESS  read-only
STATUS  current
::= { gps 4 }

END
```

Display Responses

The string that is displayed for these objects is the same display for the corresponding AT Command.

Object	AT Command
phoneNumber	*NETPHONE?
deviceID	*DEVICEID?
electronicID	I3
aleosSWVer	I1

Object	AT Command
aleosHWVer	I1
modemSWVer	I2
modemHWVer	I2
date	*DATE?
otaProgrammingEnable	OPRG?
devicePort	*DPORT?
netUID	*NETUID?
netPW	*NETPW?
requestPAP	*HOSTPAP?
destinationAddress	S53
destinationPort	S53
serialPortSettings	S23
serialPortFlowControl	\Q
ipAddress	*NETIP?
netState	*NETSTATE?
netChannel	*NETCHAN?
rssi	*NETRSSI?
serialSent	*not applicable for Raven-E*
serialReceived	*not applicable for Raven-E*
hostMode	*HOSTMODE?
powerMode	*POWERMODE? *PinPoint line modems only*
fixObtained	*PinPoint line modems only*
satelliteCount	*PinPoint line modems only*
latitude	*PinPoint line modems only*
longitude	*PinPoint line modems only*

Product ID

Each modem type has a unique ID associated with it so you can more easily identify the modem from its type on your network.

A: Configuration Commands

A

- Info (information)
- Status
- Common
- Logging
- PinPoint (GPS)
- I/O
- Edge/HSDPA

The configuration commands (AT commands) in this chapter are arranged according to their placement in AceManager.

The commands available in AceManager will depend of the model number of your PinPoint X and, in some cases, the version of the ALEOS firmware installed.

Note: Some commands can only be configured using a terminal emulation and typed AT commands. Some commands also require PassThru mode.

Tip: *You can use a fully qualified domain name instead of an IP address for most configuration options calling for an IP address if your PinPoint X is configured to use DNS. DNS settings frequently come directly from AT&T while your PinPoint X is registering on the cellular network and receiving it's IP address.*

Info (information)

The commands in the "Info" group have read-only parameters. They only provide information about the modem. Some of the information displayed in this group does not correspond directly to AT commands.

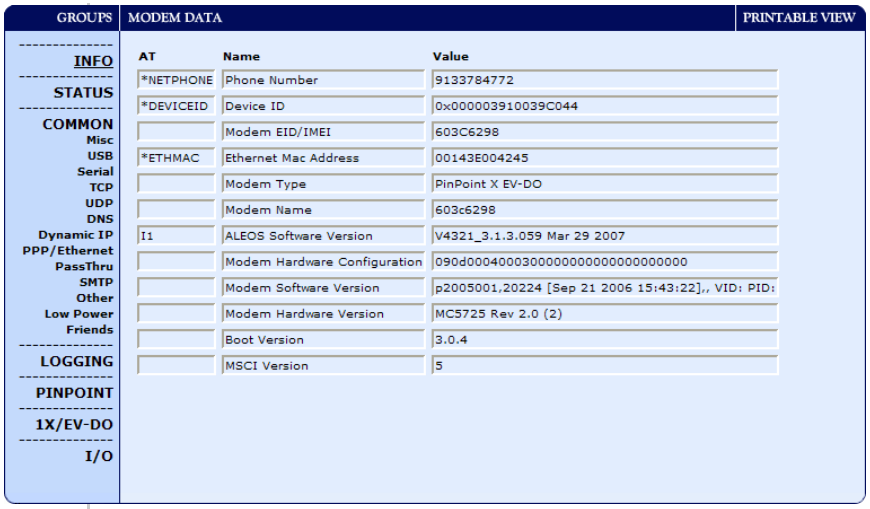


Figure 1-1: AceManager : Info

*DEVICEID?

The 64-bit device ID the modem uses to identify itself to the cellular network.

*ETHMAC?

The MAC address of the Ethernet port.

*NETPHONE?

The modem's phone number, if applicable or obtainable.

&V

View active profile, the contents of the active registers. *Not displayed with AceManager.*

I*n*

- **n=0** : Product name (for example, PinPoint X).
- **n=1** : The PinPoint X's firmware (ALEOS) version, hardware ID, and copyright.
- **n=2** : The internal hardware's firmware version and relevant hardware ID.
- **n=3** : The hardware module's unique identification number or serial number.
- **n=5** : View active profile (the contents of the active registers). *Not displayed with AceManager.*

Information Displayed in AceManager without AT Commands Listed

- **Versions of ALEOS, internal hardware, boot, and MSCI**: Versions of internally configured hardware and software.

Status

Most of the commands in the "Status" group have read-only parameters and provide information about the modem. The Status Group has more fields that can be displayed on most screens. You can either resize your window or use the scroll bar on the side to display the remainder.

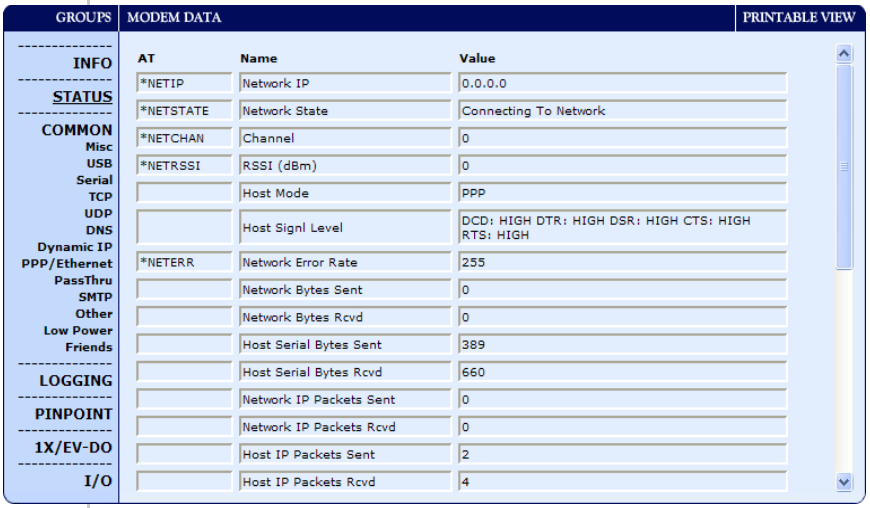


Figure 1-2: AceManager : Status

*BOARDTEMP?

The temperature, in Celsius, of the internal hardware.

*HOSTMODE?

The current host mode (AT, PPP, UDP, etc.). If the PinPoint X is not in AT mode, telnet into the modem to execute this command.

*NETERR?

The EDGE or GPRS network bit error rate.

Note: If there is no current network IP address, 0.0.0.0 may be displayed.

*NETIP?

The current IP address of the modem reported by the internal module, generally obtained from AT&T. This is the address can contact the PinPoint X from the Internet.

Tip: *Use *NETALLOWZEROIP if you need to allow the display of an IP ending in a zero.*

*NETOP?

The current cellular carrier from the modem's firmware version, for example, AT&T.

*NETRSSI?

The current RSSI (Receive Signal Strength Indicator) of the PinPoint X as a negative dBm value.

Tip: *The same information is displayed with the command S202?.*

*NETSERV?

The type of service being used by the modem, for example Tech.

*NETSTATE?

The current network state:

- **Connecting To Network:** The PinPoint X is in the process of trying to connect to the cellular network.
- **Network Authentication Fail:** Authentication to the cellular network has failed. Verify settings to activate the PinPoint X.
- **Data Connection Failed:** The PinPoint X failed to connect, and it is now waiting a set time interval before it attempts to reconnect. Verify settings to activate the PinPoint X.
- **Network Negotiation Fail:** Network connection negotiation failed. This is usually temporary and often clears up during a subsequent attempt.
- **Network Ready:** The PinPoint X is connected to the 1x cellular network and ready to send data.
- **Network Dormant:** The PinPoint Xis connected to the 1x cellular network, but the link is dormant. It will be woken up when data is sent or received.
- **No Service:** There is no cellular network detected.

- **Hardware Reset:** The internal module is being reset. This is a temporary state.

*POWERIN?

The voltage input to the internal hardware.

*POWERMODE?

Displays the current power state/mode. Possible values returned are:

- **Initial**: The modem is in the initial 5 minutes since power up, so power down event will be ignored.
- **On**: Regular power on, a power down is not pending.
- **Low Cancellable**: Power down is pending but still cancelable if the power down trigger goes away.
- **Low Pending 1** and **Low Pending 2**: Power down is pending, any modem tasks are gracefully preparing for the power down.
- **Low Final**: Power down is imminent.
- **Low**: Power is down.

Information Displayed in AceManager without AT Commands Listed

- **Bytes and Packets Received and Sent**: Network traffic for the applicable port.
- **Number of System Resets**: Counter of the number of system resets over the life of the modem or since the configuration was reset.
- **Bad Password Count**: Counter of the number of bad password attempts.
- **IP Reject Count or Log**: Rejected IP Data.
- **Temperature of the Internal Hardware Module**: The temperature of the internal radio module.
- **GPS information**: Number of satellites, GPS Fix (0 = No Fix, 1 = GPS Fix, 2 = WAAS), latitude, and longitude.

GPS Status and Map Link

In AceManager, next to the displayed information of the Latitude and Longitude, there is a link to an external map which will visually place the co-ordinates. When you click the map link, it will open your default web browser with the map location highlighted.

Note: The map feature will only work if you have access to the Internet on your computer either through the modem or separate from the modem.

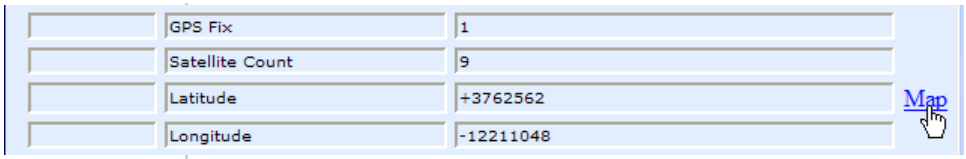


Figure 1-3: AceManager : Map link

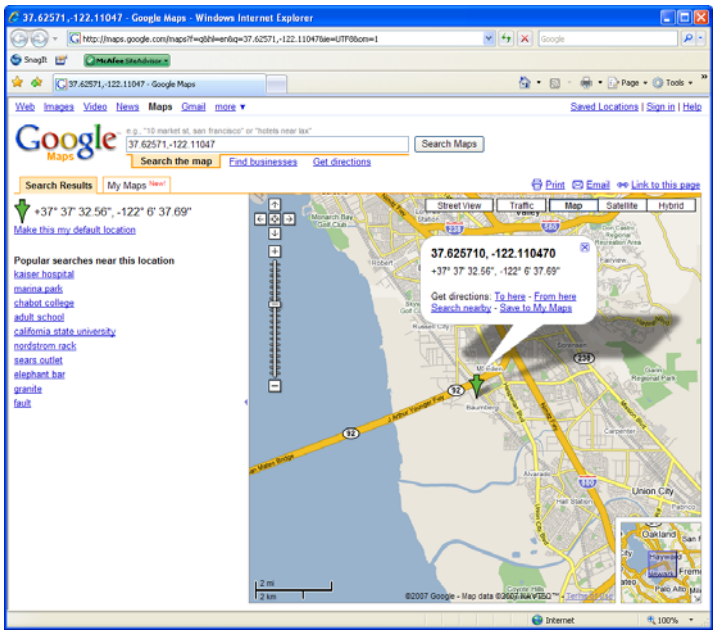


Figure 1-4: Map View

AT Commands Requiring PassThru mode

These commands are not displayed in AceManager.

+CIMI

Subscriber Identity Module ID.

Common

The groups under the heading Common encompass those commands that are common to most Sierra Wireless AirLink modems.

Misc (Miscellaneous)

The commands of the "Misc" group are a variety of commands that don't directly fit in other categories.

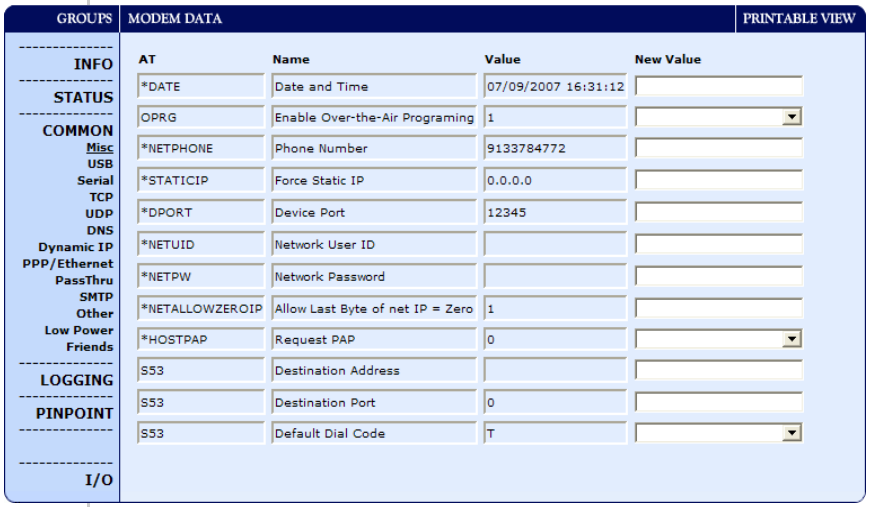


Figure 1-5: AceManager : Misc

+++

Note: +++ is not proceeded by AT nor does it require a carriage return (enter). There must be an idle time (set by S50) on the serial port before and after this command.

AT Escape sequence. If the PinPoint X is in a data mode (any mode other than PassThru), this command causes the modem to re-enter AT command mode. The "+" is ASCII 0x2B.*+++ is not available in AceManager.*

Tip: *DAE=1 disables the +++ command.*

A/

Note: A/ is not proceeded by AT.

Re-execute last command. *A/ is not used in AceManager.*

A

Manually answer an incoming connection. *A is not used in AceManager.*

D[method][d.d.d.d][/ppppp] *or* D[method][@name][/ppppp]

Dial a connection to a remote IP and Port using method. Cannot be configured in AceManager.

- **method=P** : Establish a UDP connection
- **method=T** : Establish a TCP connection
- **method=N** : Establish a Telnet connection

- **d.d.d.d=** IP address to contact
- **ppppp=** port to contact

Examples:

ATD - Dial (establish) default connection.

ATDP192.168.13.31/2332 - Dial (establish) UDP session to 192.168.13.31, at port 2332.

To end the connection, issue the +++ escape sequence or drop the DTR line (if Ignore DTR S211=0 or &D2). The default connection is set in S53.

If the method, IP address, or port is omitted, the values from S53 are used. If a telnet connection is requested (N) and the port is not supplied, port 23 will be used instead of the value from S53.

If a domain name is specified, the '@' symbol can be used to explicitly indicate the start of the name. For example, if ATDPHONY is issued, this will be interpreted as dial a UDP connection to “HONY”. To dial using the default method to host “PHONY”, one would issue ATD@PHONY.

Several special dialing numbers exist to make it easy to establish a PPP or SLIP connection with the modem. ATD#19788 or ATDT#19788 will establish a PPP connection (see \APPP) and ATDT#7547 will establish a SLIP connection (see \ASLIP).

Tip: *The source port of the session is the Device Port (set by S110 or *DPORT).*

DS=*n*

Allows a PPP connection to be initiated on the host port.

- **n=2** : Initiates the PPP connection.

Cannot be configured in AceManager.

H*n*

Hang-Up Command.

- **n=1** : Hang-up

With an AT telnet connection, this command will terminate the host data mode and return the PinPoint X to an AT mode. Cannot be accessed in AceManager.

O

Online (Remote): Causes the Raven to go from Command State to data state. Cannot be configured in AceManager.

OPRG=*n*

Enables/disables over-the-air firmware upgrading of the PinPoint X. When Sierra Wireless releases a new version of ALEOS, you can upgrade your remote modems with OPRG enabled.

- **n=0** : Disables
- **n=1** : Enables

S53=[method][d.d.d.d][/ppppp]

Destination IP address, port, and method. These are used as defaults for the D (Dial) AT command.

- **method= P** : UDP
- **method=T** : TCP
- **method=N** : Telnet
- **d.d.d.d=**IP address or domain name
- **ppppp=**the port address

Examples:

```
ATS53=T192.168.100.23/12345
ATS53=foo.earlink.com
```

Telnet to the specified IP at port 12345.

```
ATS53=192.168.100.23/12345
```

Query the specified IP at port 12345.

```
ATS53=/12345
```

Query port 12345.

Z

Reset the PinPoint X. In AceManager, this command is performed with the Reset option on the toolbar.

Tip: **DATZ=1 will disable Z.*

&W

Writes all changed modem settings. If this command is not issued, any modified values will revert back to their previous values at modem reset. Cannot be configured in AceManager.

DATE=[mm/dd/yyyy],[hh:mm:ss]*

Sets and queries the internal clock. Either the date and time can be specified, or simply one of the two can be specified in which case the unspecified value will remain unchanged. The date and time are always specified 24-hour notation.

- **mm/dd/yyyy=date** in month/day/year notation

- **hh:mm:ss=time** in 24-hour notation

*DPORT=*n*

The modem's Device Port which the modem is listening on for inbound packets/data/polls. Can also be set with the command S110.

- **n=1-65535**

*HOSTPAP=*n*

Use PAP to request the user login and password during PPP negotiation on the host connection.

- **n=0** : Disable PAP request (Default).
- **n=1** : Takes user login and password from Windows DUN connection and copies to *NETUID and *NETPW.

*NETALLOWZEROIP=*n*

Allows the displayed IP address in *NETIP to end in zero (ex. 192.168.1.0).

- **n=0** : Do not allow.
- **n=1** : Allow.

*NETPW=*pw*

The password that is used to login to the cellular network, when required.

- **pw=password** (30 characters maximum)

*NETPHONE?

The modem's phone number, if applicable or obtainable.

-

*NETUID=*uid*

The login that is used to login to the cellular network, when required.

- **uid=user id** (up to 64 bytes)

*STATICIP=*d.d.d.d*

Set the static IP required to be received from the network. If the modem does not get this IP address from the network, it will reset the internal hardware and try again. The default is 0.0.0.0, which allows any IP address from the network.

- **d.d.d.d=IP address**

Example:

```
AT*STATICIP=192.168.1.23
```

Caution: *STATICIP does not set the IP address of the modem, it merely tells the modem which IP address to expect. If the expected IP address is not granted while registering on the cellular network, the modem will try to register on the network again until it receives that IP address. If your account is set up for a dynamic IP address and you set an address for *STATICIP, you may not be able to register on the network at all since there is no guarantee you will receive the same dynamic IP address again.*

*STATUSCHK=*n*

Checks if an SMS message has been received by the modem.

- **n=1-255** : Seconds between checks.
- **n=0** : Never check.

USB

The PinPoint X is enhanced to with a USB port for additional connection options.

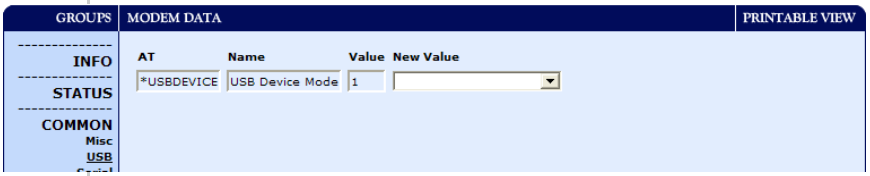


Figure 1-6: AceManager: USB

*USBDEVICE=*n*

This command configures the behavior of the USB port. For both modes, a driver supplied by AirLink will need to be installed to use the port accordingly.

- **n=0** : Port can be used as a virtual serial port.
- **n=1** : Port can be used as a virtual Ethernet port.

Serial

This group includes commands specific to general use of the serial port.

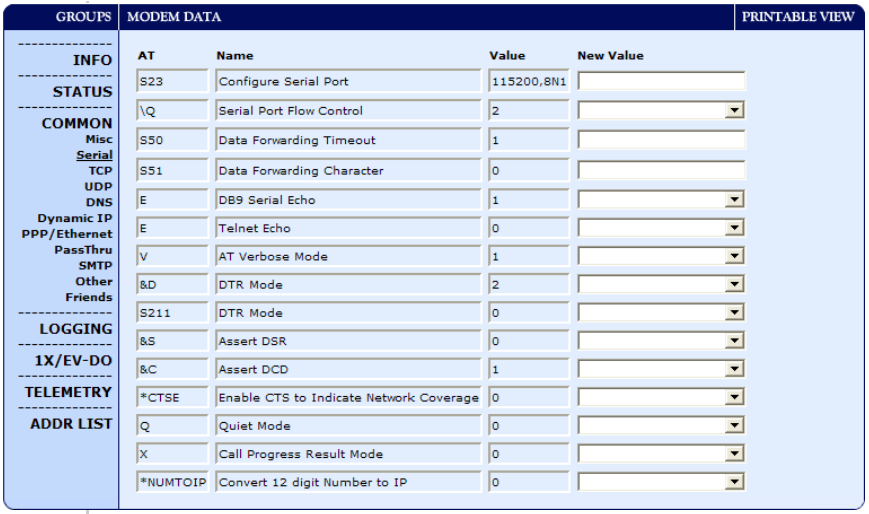


Figure 1-7: AceManager : Serial

E*n*

Toggle AT command echo mode.

- **n=0** : Echo Off.
- **n=1** : Echo On.

Note: With more than one connection types (serial, Telnet, and USB) the echo command can be set differently on each interface.

Q*n*

The AT quiet-mode setting. If quiet mode is set, there will be no responses to AT commands except for data queried.

- **n=0** : Off (Default).
- **n=1** : Quiet-mode on.

S3=*n*

The standard end of line character used to indicate the end of an AT command. This character is also used as the carriage return character for framing responses and result codes in command state. Cannot be configured in AceManager.

- **n=0-127** (ASCII character number)

S4=n

The standard line feed character sent by the modem to the host at the end of a response or return code in command state. Cannot be configured in AceManager.

- **n=0-127** (ASCII character number)

S5=n

This register sets the character recognized as a backspace during command entry. Cannot be configured in AceManager.

- **n=0-127** (ASCII character number)

S6=n

This register denotes the wait time, in seconds, before a blind dial (no dial tone detection). Cannot be configured in AceManager.

- **n=2-10** seconds

S8=*n*

Whenever a dial command contains the comma character, the contents of this register specify the pause time for each comma. Cannot be configured in AceManager.

- **n=0-255**

S9=*n*

Specifies the time that the received carrier must be present for the modem to recognize it and turn on Data Carrier Detect (DCD) if applicable. The implementation is entirely at the IWF modem. Cannot be configured in AceManager.

- **n=0-255**

S10=*n*

Specifies the amount of time that the carrier from the remote modem can be lost before the modem goes on-hook. This allows temporary disruptions to carrier without disconnecting. A setting of 255 causes the modem to disable Carrier Detect and presume carrier is always present. Cannot be configured in AceManager.

- **n=1-2545**

S23=[speed],[databits][parity][stop bits]

Serial line parameters. The settings take affect after reset.

- **speed=**300 | 1200 | 2400 | 4800 | 9600 | 19200 | 38400 | 57600 | 115200 | 230400
- **databits=**7 or 8 (Databits MUST be 8 data bits for PPP mode.)
- **parity=O** : Odd
- **parity=E** : Even
- **parity=N** : None
- **parity=M** : Mark
- **stopbits=**1 | 1.5 | 2

Example:

```
ATS23=19200,8N1
```

Sets modem to 19200, 8 databits, no parity, and 1 stop bit.

Tip: *Can also be set using &L=[speed],[databits] [parity][stop bits]*

S50=*n*

Data forwarding idle time-out. If set to 0, a forwarding time-out of 10ms is used. Used in UDP or TCP PAD mode.

- **n=tenths of a second**

S51=*n*

PAD data forwarding character. ASCII code of character that will cause data to be forwarded. Used in UDP or TCP PAD mode.

- **n=0** : No forwarding character.

S211=*n*

For applications or situations where hardware control of the DTR signal is not possible, the modem can be configured to ignore DTR. When Ignore DTR is enabled, the modem operates as if the DTR signal is always asserted.

- **n=0** : Use hardware DTR. (default).
- **n=1** : Ignore DTR.
- **n=3** : Ignore DTR and assert DSR. This value is deprecated, and it is recommended to use &S to control the DSR instead. When this value is set to 3, &S will automatically be set to 0. See also: &D and &S.

V*n*

Command Response Mode.

- **n=0** : Terse (numeric) command responses
- **n=1** : Verbose command responses (Default).

X*n*

Extended Call Progress Result mode.

- **n=0** : Turn off extended result codes (Default).
- **n=1** : Turn on result codes. This adds the text 19200 to the CONNECT response.

&C*n*

Set DCD mode.

- **n=0** : Always assert DCD.

- **n=1** : Assert DCD when in a data mode (UDP, TCP, PPP, or SLIP) (Default).
- **n=2** : Assert DCD when the modem has network coverage.

&D*n*

Set DTR mode.

- **n=0** : Ignore DTR, same effect as HW DTR always asserted (same as S211=1).
- **n=2** : Use hardware DTR (same as S211=0).

&S*n*

Set DSR mode.

- **n=0** : Always assert DSR (Default).
- **n=1** : Assert DSR when in a data mode (UDP, TCP, PPP, or SLIP) (Default).
- **n=2** : Assert DSR when the modem has network coverage.

Tip: *S211 can also be used to request that DSR is always asserted. If S211 is set to 3 and &S is changed to a non-zero value, S211 will be changed to 1.*

\APPP

Set modem operation to PPP mode. Cannot be configured in AceManager.\ASLIP

Set modem operation to SLIP mode. DTR must be asserted (&D0 or S211=1). Cannot be configured in AceManager.

\Q*n*

Set or query the serial port flow control setting.

- **n=0** : No flow control is being used.
- **n=1** : RTS/CTS hardware flow control is being used.
- **n=4** : Transparent software flow control. Uses escaped XON and XOFF for flow control. XON and XOFF characters in data stream are escaped with the @ character (0x40). @ in data is sent as @@.

*CTSE=*n*

Clear To Send Enable: This feature asserts CTS when there is a network connection.

- **n=0** : Disabled (Default).
- **n=1** : Enable assertion of CTS when there is network coverage.

RS232 voltage levels:

Positive = Network coverage.

Negative = No coverage.

Tip: *Flow control (AT\Q) will override this indication, so if you want to use CTS to indicate network coverage, flow control has to be off (AT\Q0).*

*NUMTOIP=*n*

Convert 12 digit number to IP.

- **n=0** : Use as name.
- **n=1** : Use as IP address.

*PPPNOCARRIER=*n*

Provides a "No Carrier" message to a device connected to the serial port using PPP or CHAP when the cellular connection becomes unavailable.

- **n=0** : Disabled (Default).
- **n=1** : Enabled.

TCP

This group includes commands specific to TCP serial communications.

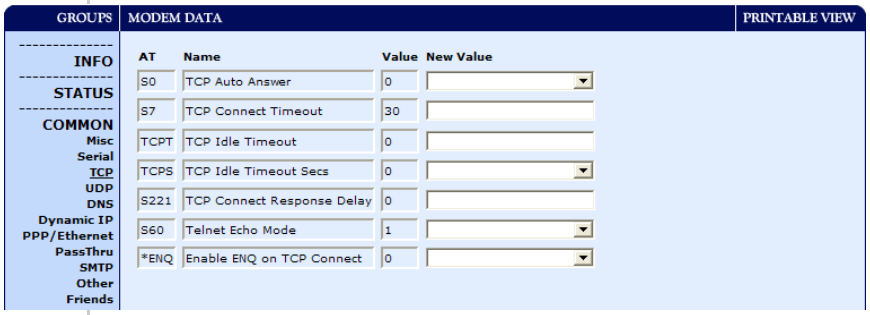


Figure 1-8: AceManager : TCP

S0=*n*

This register determines how the PinPoint X responds to an incoming TCP connection request. The PinPoint X remains in AT Command mode until a connection request is received. DTR must be asserted (S211=1 or &D0) and the PinPoint X must be set for a successful TCP connection. The PinPoint X will send a "RING" string to the host. A "CONNECT" sent to the host indicates acknowledgement of the connection request and the TCP session is established.

- **n=0** : Off (Default).
- **n=1** : On.
- **n=2** : Use Telnet server mode on TCP connections.
- **n=3** : With a Telnet connection, overrides the client's default echo, allowing the server on the host port to perform the echo. CRLF sequences from the telnet client will also be edited to simply pass CRs to the server on the host port.

S7=*n*

Specifies the number of seconds to wait for a TCP connection to be established when dialing out.

- **n=seconds**

S60=*n*

Telnet Client Echo Mode.

- **n=0** : No Echo
- **n=1** : Local Echo (Default)
- **n=2** : Remote Echo

S221=*n*

Connect Delay: Number of seconds to delay the "CONNECT' response upon establishing a TCP connection. *OR* Number of tenths of seconds to delay before outputting ENQ on the serial port after the CONNECT when the ENQ feature is enabled

- **n=0 - 255**

TCPS=*n*

TCP connection time-out (TCPS) units. Specifies a time interval upon which if there is no in or outbound traffic through a TCP connection, the connection will be terminated.

- **n=0** : minutes
- **n=1** : seconds

TCPT=*n*

Interval to terminate a TCP connection when no in or outbound traffic. This value affects only the TCP connection in TCP PAD mode.

- **n=interval**

Caution: *TCPT should never be 0 when using the TCP mode. A broken TCP session can result in the modem being left with a TCP half-open connection that can only be terminated with a reset.*

*ENQ=*n*

Outputs an ENQ [0x05] after the TCP CONNECT delayed by the Delay Connect Response time (S221).

- **n=0** : Disabled (Default).
- **n=1** : Enable ENQ on CONNECT.

UDP

This group includes commands specific to UDP serial communications.

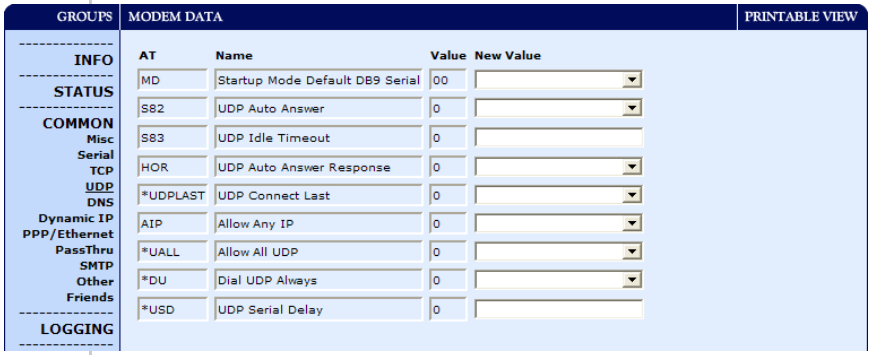


Figure 1-9: AceManager : UDP

AIP=*n*

Allow IP address.

- **n=0** : Allow only the IP address specified in S53 to connect when UDP auto answer is enabled (S82=2).
- **n=1** : Allow any incoming IP address to connect when UDP auto answer is enabled (S82=2).

Note: Always subject to any Friends filters that may be defined.

HOR=*n*

Half-Open Response - In UDP auto answer (half-open) mode.

- **n=0** : No response codes when UDP session is initiated.
- **n=1** : RING CONNECT response codes sent out serial link before the data from the first UDP packet.

Note: Quiet Mode must be Off.

MD*hh*

Default power-up mode for the serial port: When the PinPoint X modem is power-cycled, the serial port enters the mode specified by this command after 5 seconds. On startup, typing ATMD0 within 5 seconds changes the mode to normal (AT command) mode. See also S53 to set the port for UDP or TCP.

- **hh** (hex byte)**=00** : normal
- **hh=01** : SLIP
- **hh=02** : PPP
- **hh=03** : UDP
- **hh=04** : TCP
- **hh=07** : PassThru
- **hh=0F** : PinPoint MDT
- **hh=13** : Modbus ASCII
- **hh=23** : Modbus RTU (Binary)
- **hh=33** : BSAP
- **hh=63** : Variable Modbus
- **hh=73** : Reliable UDP
- **hh=83** : UDP Multicast

S82=*n*

Enables UDP auto answer (half-open) mode.

- **n=0** : Normal mode
- **n=2** : Enable UDP auto answer mode.

S83=*n*

Set or query UDP auto answer idle time-out. If no data is sent or received before the time-out occurs, the current UDP session will be terminated. While a session is active, packets from other IP addresses will be discarded (unless *UALL is set).

- **n=0** : No idle time-out (Default).
- **n=1 - 255** : Time-out in seconds.

*DU=n

The dial command always uses UDP, even when using ATDT.

- **n=0** : Dial using the means specified (default).
- **n=1** : Dial UDP always, even when using ATDT.

Note: When this parameter is set you cannot establish a TCP PAD connection.

*UALL=*n*

Accepts UDP packets from any IP address when a UDP session is active. If there is no UDP session active, an incoming UDP packet will be treated according to the UDP auto answer and AIP settings.

- **n=0** : No effect (Default).
- **n=1** : Accept UDP data from all IP addresses when in a UDP session.

*UDPLAST=*n*

*Note: *UDPLAST does not change the S53 setting in NVRAM. If the modem is reset, the original S53 setting will be restored from NVRAM.*

If enabled, sets S53 to the last accepted IP address through UDP auto answer. This can be used in conjunction with MD3 so that when there is no UDP session, new ethernet host data will cause a connection to be restored to the last IP accepted through UDP auto answer.

- **n=0** : Does not change S53 setting. (Default).
- **n=1** : Set S53 to the last accepted IP.

*USD=*n*

Waits the specified delay before sending the first UDP packet and the subsequent UDP packets out to the port Ethernet.

- **n=0** : No UDP packet delay (Default).
- **n=1 - 255** : Delay in 100ms units, from 100 ms to 25.5 sec.

DNS

This group includes commands specific to the modem being able to use domain names instead of IP addresses for other configuration options.

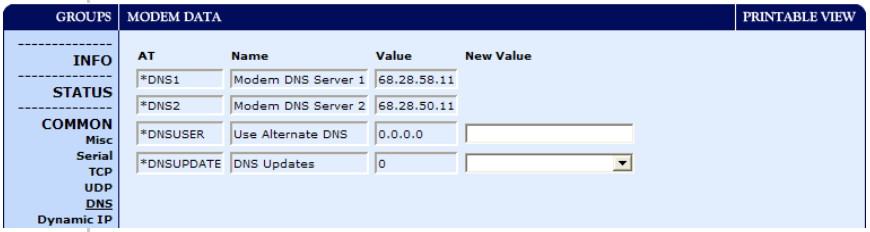


Figure 1-10: AceManager : DNS

*DNS*n*=d.d.d.d

Queries the DNS addresses. Your cellular carrier provides the DNS addresses while your modem is registering on their network.

- **n=1** or **2** : First and second DNS address.
- **d.d.d.d=IP address** of domain server.

*DNSUPDATE=*n*

Indicates whether the modem should send DNS updates to the DNS server specified by *DNSUSER. These updates are as per RFC2136. They are not secure and are recommended only for a private network. In a public network, the IP Logger services should be used instead.

- **n=0** : DNS updates disabled (Default).
- **n=1** : DNS updates enabled.

*DNSUSER=*d.d.d.d*

Sets a user-provided DNS to query first when performing name resolutions in the modem.

- **d.d.d.d=IP address** of domain server

Dynamic IP

This group includes commands specific to dynamic DNS. Dynamic DNS allows the PinPoint X to use a dynamic IP address account, with an IP address that can change each time you connect, and still allow you to use a fully qualified domain name to contact the PinPoint X using IP Manager running on a server with a dynamic DNS updater.

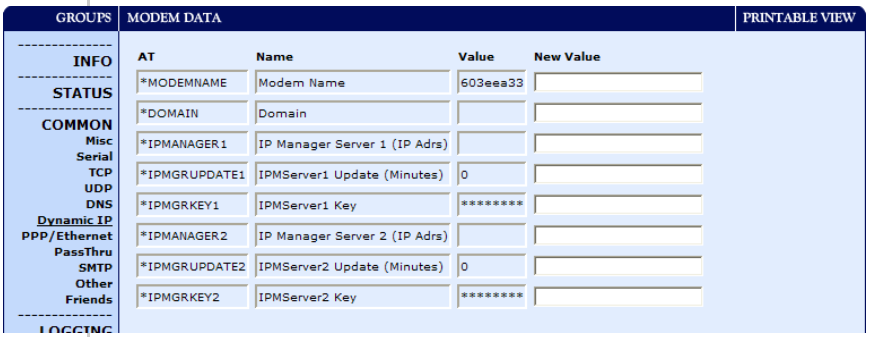


Figure 1-11: AceManager : Dynamic IP

*DOMAIN=*name*

Domain (or domain zone) of which the PinPoint X is a part. This value is used during name resolutions if a fully qualified name is not provided and also for DNS updates. This value can be up to 20 characters long.

- **name=domain name** (i.e. eairlink.com)

If *DOMAIN=eairlink.com, then when ATDT@remote1 is entered, the fully qualified name remote1.eairlink.com will be used to perform a DNS query to resolve the name to an IP address.

Tip: *Only letters, numbers, hyphens, and periods can be used in a domain name.*

*IPMANAGER*n=[name][IP address]*

Sets a domain name or IP address to send IP change notifications to. Up to two independent IP Manager servers can be set, using either AT*IPMANAGER1 or AT*IPMANAGER2. Updates to a server can be disabled by setting that entry to nothing (for example, "AT*IPMANAGER1=").

- **n=1** : First IP Manager server.
- **n=2** : Second IP Manager server.
- **name=domain name**

*IPMGRKEY*n=key*

Sets the 128-bit key to use to authenticate the IP update notifications. If the key's value is all zeros, a default key will be used. If all the bytes in the key are set to FF, then no key will be used (i.e. the IP change notifications will not be authenticated). AT*IPMGRKEY1 is used to set the key to use with AT*IPMANAGER1, while AT*IPMGRKEY2 is used to the key with AT*IPMANAGER2.

- **n=1** : First IP Manager server.
- **n=2** : Second IP Manager server.
- **key=128-bit key** in hexadecimal [32 hex characters]

*IPMGRUPDATE*n=m*

Sets the number of minutes to periodically send an IP update notification to the corresponding server. This will occur even if the IP address of the PinPoint X doesn't change. *IPMGRUPDATE1 is used to set the refresh rate to *IPMANAGER1, while *IPMGRUPDATE2 is used with *IPMANAGER2. If the value is set to 0, then periodic updates will not be issued (i.e. IP change notifications will only be sent when the IP actually changes).

- **n=1** : First IP Manager server.
- **n=2** : Second IP Manager server.
- **m=0, 5-255** : Number of minutes to send an update.

*MODEMNAME=name

Name of the PinPoint X (up to 20 characters long) to use when performing IP address change notifications to IP Manager. The value in *DOMAIN provides the domain zone to add to this name.

- **name=modem name** (for example, mymodem)

Example: if *MODEMNAME=mymodem and *DOMAIN=eairlink.com, then the modem's fully qualified domain name is mymodem.eairlink.com.

Automatically Generated Names:

#I3 - The ESN/IMEI will be used as the name.

#CCID - The CCID will be used as the name.

#NETPHONE - The phone number will be used as the name.

Tip: *Each modem using IP Manager needs a unique name. Two modems cannot be called "mymodem". One could be "mymodem1" with the other as "mymodem".*

PPP/Ethernet

This group includes commands specific to PPP (serial) or Ethernet connections between the PinPoint X and a connected device.

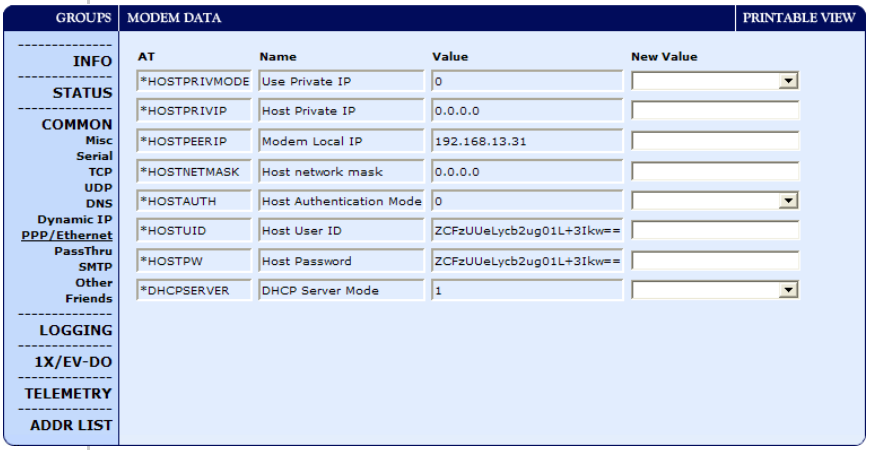


Figure 1-12: AceManager : PPP/Ethernet

*DHCPSERVER=n

- Act as a DHCP server for any Ethernet device connecting to the PinPoint X. DHCP (Dynamic Host Configuration Protocol) allows one device, the DHCP server, to provide dynamic IP addresses to any other device which requests them.
- **n=1** : Enabled. The modem will act as the primary DHCP server for the network.
- **n=2** : Enabled if no other DHCP server is detected (default). If another DHCP server is detected on the network, the PinPoint X will not send out replies to DHCP

requests.**n=0** : Disabled. The Raven X will not send out replies to DHCP requests.

Tip: *For PPPoE, set *DHCPSERVER=0.*

*HOSTAUTH=*n*

Host Authentication Mode: Use PAP or CHAP to request the user login and password during PPP or CHAP negotiation on the host connection. The username and password set in *HOSTUID and *HOSTPW will be used.

- **n=0** : Disable PAP or CHAP request (Default).
- **n=1** : PAP and CHAP.
- **n=2** : CHAP

Tip: *For PPPoE, set *HOSTAUTH=1 or *HOSTAUTH=2.*

*HOSTNETMASK=*n.n.n.n*

Subnet mask for the host interface. Allows communication with a subnet behind the host interface.

- **n.n.n.n = subnet mask**, example 255.255.255.0.

*HOSTPEERIP=*d.d.d.d*

Set or query the IP address that can be used to directly contact the PinPoint X once a cellular connection is established. If this value is not specified, 192.168.13.31 will be used.

- **d.d.d.d=local or peer IP address** of the modem.

Note: This is not normally used nor needed by user applications.

*HOSTPRIVIP=*d.d.d.d*

Set or query the private IP address that is to be negotiated by the 1x connection if *HOSTPRIVMODE =1.

- **d.d.d.d=IP Address**

*HOSTPRIVMODE=*n*

Set or query whether a private or public (network) IP is to be used when the Host initiates a 1x connection to the modem.

- **n=0** : Public (network) IP Mode: When the Host initiates a PPP connection, the host will be given the network IP address that was obtained from the cellular carrier while registering on the network. If the network issues a new IP

address, the cellular connection will be closed (since the IP address has changed) and has to be re-initiated. (default).

- **n=1** : Private IP Mode: When the Host initiates a 1x connection, the host will be given the IP address specified in *HOSTPRIVIP. The modem will then perform 1 to 1 NAT-like address translation, which shields the Host from network IP changes.

*HOSTPW=*string*

Host Password for PAP, CHAP, or PPPoE.

- **string=password**

*HOSTUID=*string*

Host User ID for PAP, CHAP, or PPPoE.

- **string=user id** (up to 64 bytes)

PassThru

PassThru Mode is used to communicate directly to the PinPoint X internal hardware.

Caution: *While the modem is in PassThru mode, ALEOS is disabled. If you need to connect to the PinPoint X while it is in PassThru mode, you will need to do so with a terminal application. Not all commands are available while the modem is in PassThru mode.*

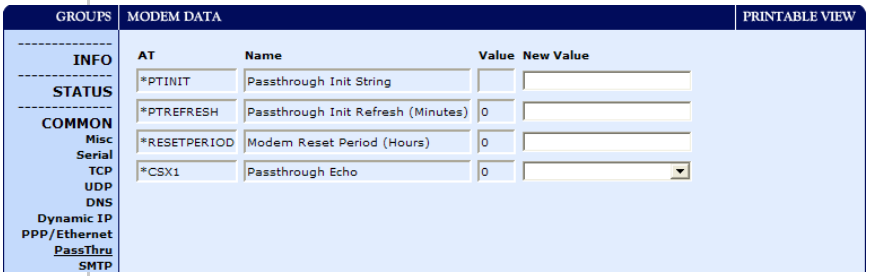


Figure 1-13: AceManager : PassThru

\APASSTHRU

Note: This mode is not available through the remote AT telnet server. You will need to connect to the PinPoint X with it connected directly to your computer.

Sets the modem operation to pass through mode. This mode will pass any characters received on the port Ethernet directly to the internal hardware module and output any characters from the internal hardware module out the port Ethernet. This allows direct access/configuration of the hardware module. Once this mode is entered, the unit must be physically reset to return to normal operation. This command is not available in AceManager.

Note: It may take up to 30 seconds for the hardware module to respond after CONNECT is output.

*CSX1=*n*

PassThru Echo : Echo data to the host.

- **n=0** : Data will be passed to the host.
- **n=1** : PASSTHRU mode will echo all host received data and will not pass the data to the modem while the modem is not asserting DCD.

*Note: If the modem is asserting DCD, data will be passed from the host to the modem as it normally is when *CSX1=0.*

*PTINIT=*string*

Any AT Command string to be passed to the OEM module before entering PASSTHRU mode, e.g. AT&S1V1, etc.

- **string=AT command(s)**

*PTREFRESH=*n*

Number of minutes of inactivity in PASSTHRU mode to resend the *PTINIT string to the hardware module.

- **n=0** : Disabled
- **n=1-255** minutes

*RESETPERIOD=*n*

In PASSTHRU mode, modem will be reset after this period if no data has been sent or received. Value is in hours.

- **n=0** : Disabled
- **n=1-255** hours

SMTP

SMTP (Simple Mail Transfer Protocol) is the de facto standard for email transmission across the Internet. The PinPoint X can send messages using SMTP if it has been configured to use a mail server.

Note: You cannot send an Email with your PinPoint X unless the Email server you have configured allows your PinPoint X as a relay host. Talk to your network administrator to ensure you can send email through the email server using your PinPoint X.

SMS (Short Message Service) is another way to send messages via the cellular network. Most SMS commands require the modem to be in PassThru mode.

Note: SMS may not be supported by your account with your cellular carrier.

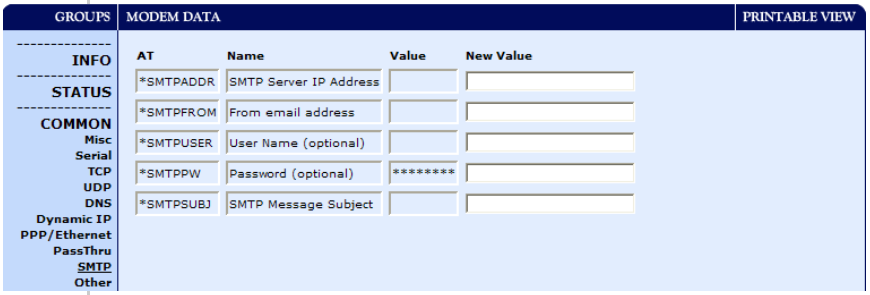


Figure 1-14: AceManager : SMTP

*NETSMS2EMAIL=*n*

Specify the SMS/E-mail server number. This maybe necessary to send an SMS message to an email address. Cannot be used with AceManager.

- **n=SMS/E-mail server number**

*SMTPADDR=[d.d.d.d][name]

Specify the IP address or Fully Qualified Domain Name (FQDN) of the SMTP server to use.

- **d.d.d.d=IP Address**
- **name=domain name** (maximum: 40 characters).

*SMTPFROM=*email*

Sets the email address from which the SMTP message is being sent.

- **email=email address** (maximum: 30 characters).

*SMTPPW=pw

Sets the password to use when authenticating the email account (*SMTPFROM) with the server (*SMTPADDR).

- **pw= password**

Note: Not required to use SMTP settings but may be required by your cellular carrier.

*SMTPSEND=*email*[body]

Sends an email to the address specified, followed by the body of the email message. The email message is terminated and sent by entering a **.** or Ctrl-Z on an empty line. Cannot be configured with AceManager.

- **email=email address**
- **body=message** body

*SMTPSTATUS?

Returns the status of the last issued SMTP message (*SMTPSEND). If no status is available 0 is returned. Once read, the status is cleared out. The status codes returned come from the SMTP server to which that the modem sent the request. Unless the receiving server is not standard, they follow the RFC for SMTP. Cannot be used with AceManager.

Example:

```
354 = send in progress
250 = sent ok
```

*SMTPSUBJ=subject

Allows configuration of the default Subject to use if one isn't specified in the message by providing a “Subject: xxx” line as the initial message line.

- **subject=message subject**

*SMTPUSER=user

The email account username to authenticate with the SMTP server (*SMTPADDR) for sending email.

- **user=username** (maximum: 40 characters).

Note: Not required to use SMTP settings but may be required by your cellular carrier.

Remarque :

Other

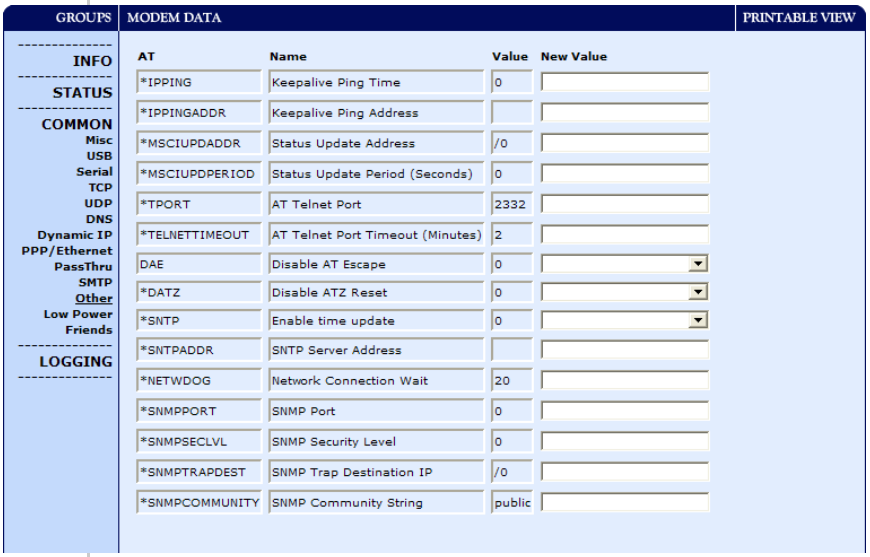


Figure 1-15: AceManager : Other

DAE=*n*

AT Escape Sequence detection.

- **n=0** : Enable
- **n=1** : Disable

*DATZ=*n*

Enables or disables reset on ATZ.

- **n=0** : Normal Reset (Default).
- **n=1** : Disable Reset on ATZ.

*IPPING=*n*

Set the period to ping (if no valid packets have been received) a specified address (*IPPINGADDR) to keep the modem alive (online).

- **n=0** : Disable pinging (default)
- **n=15-255** minutes

*Note: 15 minutes is the minimum interval which can be set for Keepalive. If you set *IPPING for a value between 0 and 15, the minimum value of 15 will be set.*

IPPINGADDR=[d.d.d.d][name]*

Set the IP address or valid internet domain name for the PinPoint X to ping to keep itself alive (online). *IPPING must to be set to a value other than 0 to enable pinging.

- **d.d.d.d=IP address**
- **name=domain name**

*MSCIUPDADDR=*name[/port]*

Modem Status Update Address - where Name/Port is the domain name and port of the machine where the modem status updates will be sent. The status parameters of the PinPoint X are sent in an XML format.

- **name=domain name**
- **port=port**

*MSCIUPDPERIOD=*n*

Modem Status Update Period - where n defines the update period in seconds.

- **n=0** : Disabled.
- **n=1-255** seconds

*NETWDOG=*n*

Network connection watchdog: The number of minutes to wait for a network connection. If no connection is established within the set number of minutes, the PinPoint X modem resets.

- **n=0** : Disabled.
- **n=minutes** : Default = 120 min.

*RESETCFG

Wipe the non-volatile data in the modem. Cannot be used with AceManager.

Caution: *You may need to reactivate your modem if you erase the non-volatile data.*

*SNMPCOMMUNITY=*string*

The SNMP Community String acts like a password to limit access to the modem's SNMP data.

- **string =string** of no more than 20 characters (default = public).

*SNMPPORT=*n*

This controls which port the SNMP Agent listens on.

- **n=0** : SNMP is disabled.
- **n=1-65535**

*SNMPSECLVL=*n*

Selects the security level requirements for SNMP communications.

- **n=0** : No security required. SNMPv2c and SNMPv3 communications are allowed.
- **n=1** : Authentication equivalent to “authNoPriv” setting in SNMPv3. SNMPv3 is required to do authentication, SNMPv2c transmissions will be silently discarded.
- **n=2** : Authentication and encryption, equivalent to “authPriv”' setting in SNMPv3. SNMPv3 is required to do authentication and encryption, SNMPv2c and SNMPv3 authNoPriv transmissions will be silently discarded. Messages are both authenticated and encrypted to prevent a hacker from viewing its contents.

*SNMPTRAPDEST=host/[port]

Controls destination for SNMP Trap messages. If port is 0 or host is empty, traps are disabled. Traps are sent out according to the SNMP security level (i.e. if the security level is 2, traps will be authenticated and encrypted). Currently, the only trap that can be generated is linkup.

- **host=IP address**
- **port=TCP port**

*SNTP=*n*

Enables daily SNTP update of the system time.

- **n=0** : Off
- **n=1** : On

SNTPADDR=[d.d.d.d][name]*

SNTP Server IP address, or fully-qualified domain name, to use if *SNTP=1. If blank, time.nist.gov is used.

- **d.d.d.d=IP address**
- **name=domain name**

*TELNETTIMEOUT=*n*

Telnet port inactivity time out. By default, this value is set to close the AT telnet connection if no data is received for 2 minutes.

- **n=minutes**

*TPORT=*n*

Sets or queries the port used for the AT Telnet server. If 0 is specified, the AT Telnet server will be disabled. The default value is 2332.

- **n=0** : Disabled.
- **n=1-65535**

Tip: *Many networks have the ports below 1024 blocked. It is recommended to use a higher numbered port.*

*TQUIT

Disconnects the telnet session. Not available in AceManager..

Low Power

The PinPoint X will put itself into a low power using mode when configured events occur. Low Power mode is essentially a standby mode which uses minimal power while being ready to "come alive" quickly.

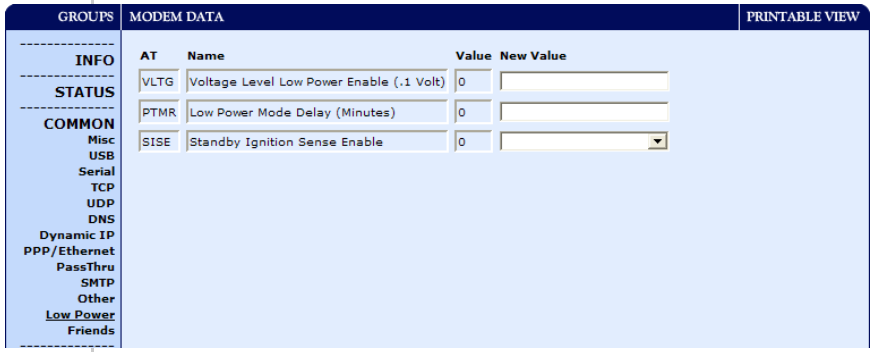


Figure 1-16: AceManager : Low Power

PTMR=*n*

Number of minutes after one of the power down events (VTLG or DTRP) happens until the PinPoint X enters the low power mode. If DTRP and VLTG are both 0 (zero), this setting does nothing.

- **n=0-255** minutes

Note: There is always a minimum of 1 minute between power down event and actual shutdown (to give the PinPoint X time to prepare); entering zero will not power down the modem immediately, but after

one minute.In the first 5 minutes after PinPoint X powers up, power down events are ignored to give the user time to change configurations.

SISE=*n*

Standby Ignition Sense Enable: the PinPoint X will monitor the ignition sense on the power connector and enter the low power consumption stand-by mode when the ignition is turned-off.

- **n=0** : Disable
- **n=1** : Enable

VLTG=*n*

Set or query the voltage level at which the PinPoint X goes into low power mode.

- **n=0** : Ignore voltage for power control.
- **n=threshhold** in tenths of volts

Example: ATVLTG=130 would place the modem in a low power use, standby state if the voltage goes below 13.0V.

Friends

Friends Mode can limit access to the PinPoint X from the cellular network and the Internet. Friends mode is a basic firewall.

Caution: *If you are using Friends Mode you will not be able to use AceManager remotely or Telnet to the modem unless you are contacting the modem from one of the configured IP addresses.*

Note: Friends Mode will only prevent the PinPoint X modem from receiving data from those IP addresses not on the Friends List. It cannot prevent data, such as pings, from traversing the network to the modem which may billable traffic even though the modem does not receive the data.

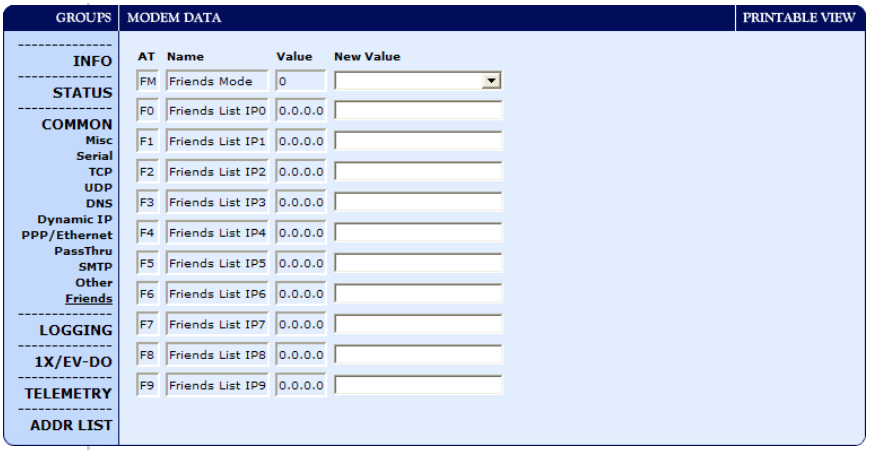


Figure 1-17: AceManager : Friends

FM=*n*

Friends Mode - Only allow specified IPs to access the PinPoint X modem.

- **n=0** : Disable Friends mode
- **n=1** : Enable Friends mode - Only packets from friends will be accepted, packets from other IP addresses are ignored.

F*n*=*[d.d.d.d]*

Friends mode IP address.

- **n=0-9** Friends list index
- **d.d.d.d = IP address**

Using 255 in the IP address will allow any number.

Example: 166.129.2.255 allows access by all IPs in the range 166.129.2.0-166.129.2.255.

Tip: *ATF? will return a list of all the current Fn settings.*

Logging

This group includes commands specific to the internal log.

Caution: *Logging is intended for diagnostic purposes only. Extensive use of logging features can cause degraded modem performance.*

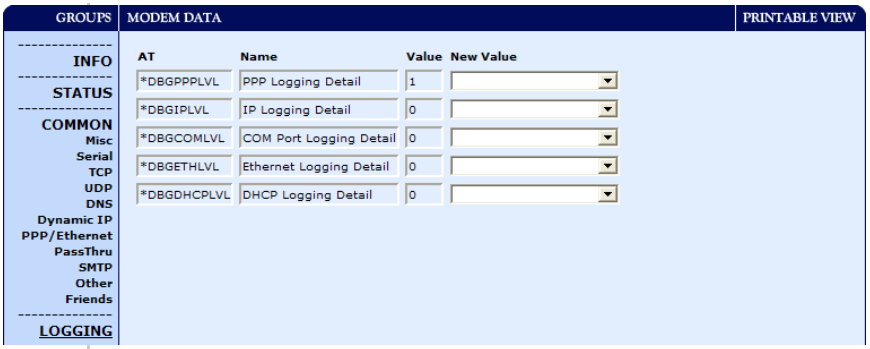


Figure 1-18: AceManager : Logging

*DBGCOMMLVL=*n*

Set the logging level for the host or module COM port.

- **n=0** : No logging
- **n=1** : Host COM Port
- **n=2** : Module COM Port

*DBGDHCPLVL=*n*

Enable or disable internal DHCP logging.

- **n=0** : No logging
- **n=1** : Log DHCP events.

*DBGETHLVL=*n*

Sets the logging level for the Ethernet port.

- **n=0** : No logging
- **n=1** : Log errors: invalid/corrupt packets, etc.
- **n=2** : Log the header of all received packets. Note that this can quickly exhaust available space for the event log.

*DBGIPLVL=*n*

Sets the logging level for the IP subsystem.

- **n=0** : No logging
- **n=1** : Log errors (i.e. invalid/corrupt packets, etc.).
- **n=2** : Log the header of all received packets. Note that this can quickly exhaust available space for the event log.
- **n=3** : Log the header of all received and sent packets. Note that this can quickly exhaust available space for the event log.

*DBGPPPLVL=*n*

Sets the logging level for the PPP stack.

- **n=0** : No logging

- **n=1** : Log client events (default)
- **n=2** : Log server events
- **n=3** : Log client and Server events

PinPoint (GPS)

This group includes commands specific to GPS features and the PinPoint X

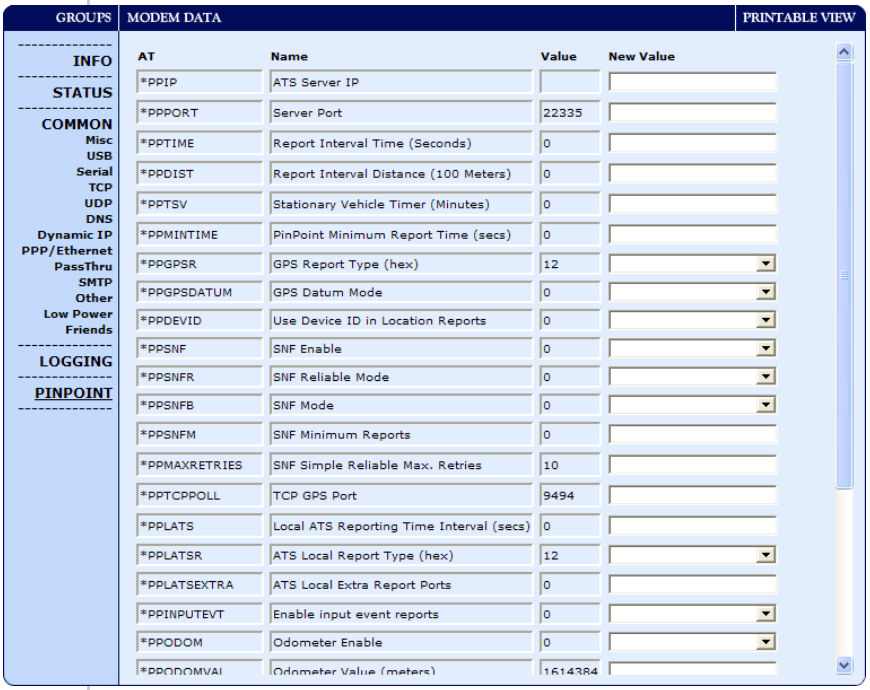


Figure 1-19: AceManager : PinPoint

GPS*n*

Send NMEA GPS strings out serial link. ATGPS (no parameter) will cause the NMEA GGA, RMC, and VTG GPS strings to output to the serial port one time. *Not available in AceManager.*

- **n=1** : ATGPS1 will cause these strings to be sent out the serial link once per second continuously until ATGPS or until reset.

#IG=n

Time in seconds to wait for GPS acquisition before transmitting at high rates.

- **n=seconds**

#U

Immediately issue GPS report to the ATS server IP and port. *Not available in AceManager.*

*PGPS=n

Send NMEA GPS strings out serial link. Similar to ATGPS except that the *PGPS value can be saved to NVRAM so that it will continue to operate after resets.

- **n=0** : Disabled
- **n=1** : Send NMEA GPS strings out serial link.
- **n=2** : Send NMEA GPS strings out the USB port.
- **n=3** : Send NMEA GPS strings out both the serial and the USB port.

*PGPSF=n

Persistant GPS frequency

- n= number of seconds per report

Max Value: 65535 up to 18 hours

*PPCOM1000=*n*

Enables support for extra inputs from a COM1000.

- **n=0** : Disable
- **n=1** : Enable

Tip: *If both AT*PPCOM1000=1 and AT*PPREPORTINPUTS=1 are enabled, the PinPoint X digital inputs will be reported and the COM1000 inputs will be ignored.*

*PPDEVID=*n*

Whether or not the PinPoint X should include the 64-bit device ID in its GPS reports. *PPDEVID MUST be 1 if the modem uses a Dynamic IP.

- **n=0** : Disable ID.
- **n=1** : Enable/display ID.

*PPDIST=*n*

GPS Report Distance Interval in 100 Meter Units (kilometer). 1 mile is approximately 1600 kilometers.

- **n=0** : Disabled
- **n=1-65535**

*PPFLUSHONEVT=*n*

Flushes store and forward buffer when an input event (DTR/RTS) occurs.

- **n=0** : Disable
- **n=1** : Enable

*PPGPSDATUM=n

Specifies the GPS datum to use for position reports. For accurate results, this value should match the datum used by receiving mapping application.

- **n=0** : WGS84
- **n=92** : NAD27
- **n=115** : NAD83

*PPGPSSENTENCES=*n*

Specifies the NMEA sentences to display in the NMEA GPS Report.

- **n=0-65535 (hex)**

*PPGPSR=*n*

GPS report type.

- **n=0x11** : Standard GPS Report
- **n=0x12** : Standard GPS Report + UTC Date
- **n=0x13** : Standard GPS Report + UTC Date + RF data
- **n=0xE0** : GGA and VTG NMEA reports
- **n=0xE1** : GGA, VTG and RMC NMEA reports
- **n=0xF0** : TAIP reports
- **n=0xF1** : Compact TAIP data

*PPIGNOREIP=*n*

When enabled, ignore ATS Server IP (*PPIP) updates in RAP.

- **n=0** : Use ATS Server IP updates.
- **n=1** : Ignore ATS Server IP updates.

*PPINPUTEVT=*n*

Enable sending input changes as events (different report types).

- **n=0** : Disable
- **n=1** : Enable

*PPIP=*d.d.d.d*

IP address where GPS reports are sent (ATS Server IP). Also see *PPPORT.

- **d.d.d.d=IP address**

Example:

```
AT*PPIP=192.100.100.100
```

*PPLATS=*n*

Local ATS - Causes GPS reports to also be sent out the serial or Ethernet link every *n* seconds, when there is a PPP connection to the serial host or a connection to the Ethernet port is established.

- **n=0** : Disable
- **n=1-255** seconds

Tip: *Sends to the PPP peer IP S110 with the Destination Port number S53.*

*PPLATSEXTRA=*n*

Have local ATS reporting (LATS) send up to 7 extra copies of a GPS report to the subsequent ports.

- **n=0** : Just the original report is sent (default).
- **n=1-7** : Send GPS report copies to that number of ports.

Example: If AT*PPLATSEXTRA=7 and the port in S53 is 1000, then GPS reports will be sent to ports 1000-1008.

*PPLATSR=*n*

Indicates the type of GPS report to send to the local client (PPP/SLIP peer). See *PPGPSR.

- **n=0x11** : Standard GPS Report
- **n=0x12** : Standard GPS Report + UTC Date
- **n=0x13** : Standard GPS Report + UTC Date + RF data
- **n=0xE0** : GGA and VTG NMEA reports
- **n=0xE1** : GGA, VTG and RMC NMEA reports
- **n=0xF0** : TAIP reports
- **n=0xF1** : Compact TAIP data

*PPMAXRETRIES=*n*

Maximum number retries when in Simple Reliable Mode.

- **n=0** : Disabled
- **n=1-255** retries

*PPMINTIME=*n*

Specifies the minimum amount of time between reports generated due to either the time interval (*PPTIME) or the distance interval (*PPDIST). This is useful to limit network traffic and make more efficient use of bandwidth. This can be used in conjunction with store and forward. The minimum value which this setting can take depends on the policies of the carrier.

- **n=0** : Disabled
- **n=1-65535** seconds

*PPODOM=*n*

Enable odometer reporting.

- **n=0** : Disabled (default)
- **n=1** : Enabled

*PPODOMVAL=*n*

The current odometer value of the PinPoint X. The value is in meters. Maximum value is approximately 4.3 billion meters (2.5 million miles). 1 mile is approximately 1600 meters.

- **n=meters**

*PPPORT=*n*

Port where GPS reports are sent.

- **n=1-65535**

*PPREPORTINPUTS=*n*

Enable input reporting.

- **n=0** : Disabled
- **n=1** : Enabled

*Note: If both AT*PPCOM1000=1 and AT*PPREPORTINPUTS=1 are enabled, the PinPoint X digital inputs will be reported and the COM1000 inputs will be ignored.*

*PPSIMPLETO=*n*

Defines the linear back-off base number. Not available in AceManager.

- **n=0** : Disabled
- **n=5-255**

*PPSNF=*n*

Store and Forward will cause GPS reports to be stored up if the PinPoint X goes out of network coverage. Once the vehicle is in coverage the GPS reports will be sent en masse to the server.

- **n=0** : Disabled
- **n=1** : Enabled (default)

*PPSNFB=*n*

Store and Forward Behavior. When *PPSNF=1, the type of Store and Forward behavior is defined by:

- **n=0** : Normal Store and Forward. Data is stored when the PinPoint X is out of cellular coverage; when the PinPoint X is in coverage, data is sent to server as soon as possible.
- **n=1** : Data sent only when polled. Data is stored until polled using the Poll command sent by a server.
- **n=2** : Grouped Reports. Data is stored until the desired minimum number of reports (see *PPSNFM) has been stored. The data is then sent to the server in groups with at least the specified number of reports.

*PPSNFM=*n*

Store and Forward Minimum Reports. Specifies the minimum number of reports that must be stored before they are forwarded to the server. The data is then sent to the server in packets that contain at least this number of reports.

- **n=0-255**

*PPSNFR=*n*

Store and Forward Reliability: GPS reports will be retransmitted if not acknowledged by the server.

- **n=0** : Disabled
- **n=1** : Reliable mode enabled for RAP messages
- **n=2** : Simple reliable mode

*PPTAIPID=*nnnn*

Sets/queries the TAIP ID. This ID is returned in TAIP reports if it has been negotiated with the TAIP client. This value is only used in conjunction with TAIP emulation mode (*PPGPSR=F0).

- **nnnn=TAIP ID** (4 characters)

*PPTCPPOLL=n

Specifies the port to listen on for TCP GPS report polling. The request to this port needs to come from the same IP address in *PPIP.

- **n=0** : Disabled
- **n=1-65535** (default 9494)

*PPTIME=*n*

GPS Report Time Interval. See also *PPMINTIME, *PPTSV, +CTA.

- **n=seconds** (1 - 65535)

Note: Your cellular carrier may impose a minimum transmit time.

Caution: *A report time of less than 30 seconds can possibly keep an RF link up continuously. This will eventually cause the PinPoint X to overheat and shutdown. An RF resource may continue be tied up to transfer small amounts of data. Generally the RF channel will be released and go dormant in 10-20 seconds of no data sent or received.*

*PPTSV=*n*

Timer for Stationary Vehicles. Time interval in minutes that the PinPoint X will send in reports when it is stationary.

- **n=0** : Disabled
- **n=1-255** minutes

For example, if *PPTIME=10, the PinPoint X will send in reports at least every 10 seconds while it is moving; however, once it stops moving, it will slow the reports down to this *PPTSV value.

*UDPRGPS=*n*

Set or query GPS stamping of UDP Reliable packets. When set, data received on the host serial port will be encapsulated with the GPS date and time.

- **n=0** : Disabled (default)
- **n=1** : Enabled

I/O

This group includes configuration commands for the digital and analog inputs and relay outputs. Some of the values shown as a part of this group are not changeable but reflect the current status.

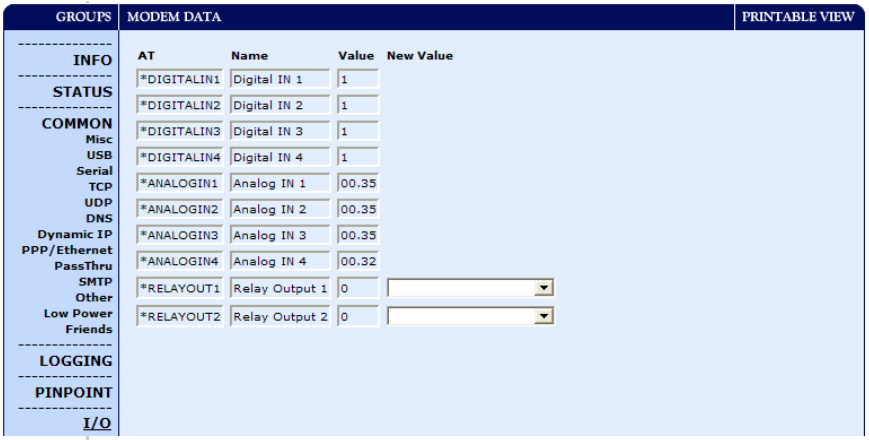


Figure 1-20: AceManager : I/O

*ANALOGIN*n*?

Query individual analog inputs. The analog inputs report the voltage in volts.

- ***n*=1-4** Input number

*DIGITALIN*n*?

Query individual digital inputs. The digital inputs report either a **0** (open) or **1** (closed).

- ***n*=1-4** Input number

*IOSTATE=*n,s*

Query the full set of digital inputs, analog inputs, and relay outputs, or set the relay outputs.

- ***n*=1-4** Input number
- ***s*=OPEN** or **CLOSED**

When you query the inputs (AT*IOSTATE?), they will all be listed with their current state. Example:

```
DI1  OPEN
DI2  CLOSED
DI3  OPEN
DI4  OPEN
DO1  OPEN
DO2  CLOSED
AI1  0.35 volts
AI2  12 volts
AI3  6.8 volts
AI4  1.3 volts
```

*RELAYOUT*n=x*

Set or query the relay outputs.

- ***n*=1-2** Input number
- ***s*=OPEN** or **CLOSED**

Edge/HSDPA

This group includes commands specific to HSDPA, EDGE and GPRS. If you are not connecting to a modem which uses HSDPA, EDGE, or GPRS, you will not see this group in the menu.

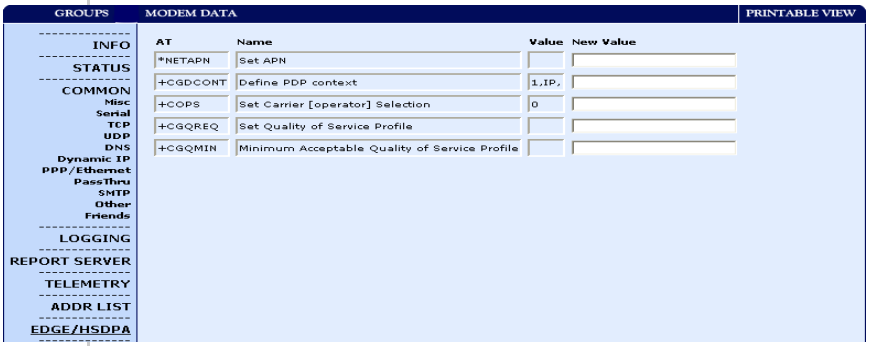


Figure 1-21: AceManager : EDGE/HSDPA

*NETAPN=*apn*

Easy entry of the APN. If left blank, the modem will attempt to use the default subscriber value as defined by the account.

- **apn=access point name**

+CGQMIN

Minimum Acceptable Quality of Service Profile. Change should be at carrier's request. Normally not required to be changed.

+CGQREQ

Set Quality of Service Profile. Change should be at carrier's request. Normally not required to be changed.

+COPS=*mode,[format][,oper]*

Manually specify an operator. Refer also to *NETOP.

- **mode=0** : Automatic - any affiliated carrier [default].
- **mode=1** : Manual - use only the operator <oper> specified.
- **mode=4** : Manual/Automatic - if manual selection fails, goes to automatic mode.
- **format=0** : Alphanumeric ("name").

- **format=2** : Numeric
- **oper=”name”**

B: PPP over Ethernet (PPPoE)

B

- Configuring the PinPoint X for PPPoE
- Configuring a PPPoE Connection in Windows
- Connecting to the Internet with PPPoE

PPPoE (Point-to-Point Protocol over Ethernet) allows a point-to-point connection while using Ethernet or the USB virtual Ethernet. Just like the dial up protocol on which it is based, PPPoE uses traditional user name and password authentication to establish a direct connection between two Ethernet devices on a network (such as your PinPoint X and your computer or router).

Application examples for PPPoE with your PinPoint X:

- Backup connectivity solution for your network.
- Individualized Internet connection on a LAN.
- Password restricted Internet connection.

Only one computer, router, or other network device at a time can connect to the PinPoint X using PPPoE.If you are using the PinPoint X connected to a router as a back up Internet connection for your network, you should configure the router to use the PPPoE connection and not the individual computers.

Tip: *You may need to use Private Mode to configure the IP address of your PinPoint X to be available on a LAN.*

Note: To configure a PPPoE connection on Microsoft Windows XP, 2000 or NT, you will need administrator privileges to the computer you are configuring or access granted by an administrator on the network to add/remove devices to your computer.

Configuring the PinPoint X for PPPoE

Before you can use PPPoE with your PinPoint X, you will need to configure it to support PPPoE connections.

1. Configure your PinPoint X to support PPPoE

a. Connect your PinPoint X directly to your computer and start AceManager.

b. From the groups on the left, select *PPP/Ethernet* under Common.

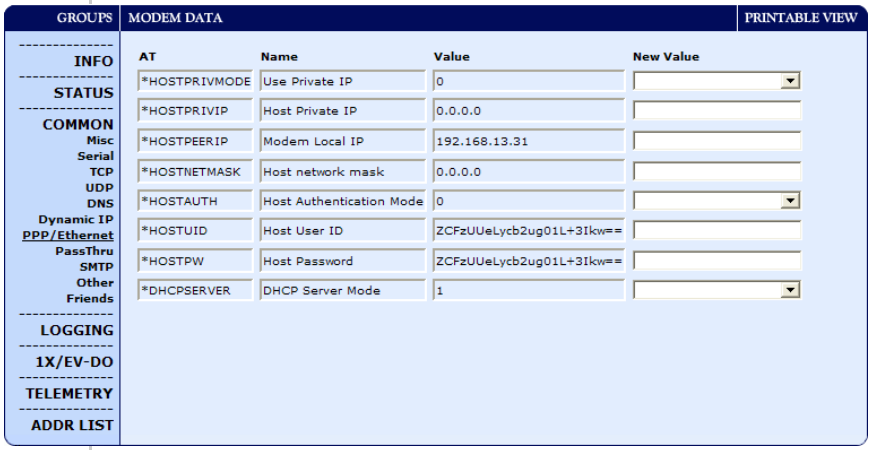


Figure 2-1: AceManager : PPP/Ethernet

c. Change *HOSTAUTH to 2.

d. Enter a user name for *HOSTUID for the PPPoE connection.

e. Enter a password for *HOSTPW for the PPPoE to connection.

f. Change *DHCPSERVER to 0

Tip: *If you leave *HOSTUID and *HOSTPW blank, any computer or device can connect to the PinPoint modem using PPPoE.*

*Note: AceManager shows the existing values for *HOSTUID and *HOSTPW encrypted and character padded.*

2. Optional: Configure *MODEMNAME

PPPoE connections can use a Service Name to differentiate PPPoE devices.

a. In AceManager, select Dynamic IP from the groups on the left.

b. Enter a name for *MODEMNAME, such as PinPoint X or the ESN.

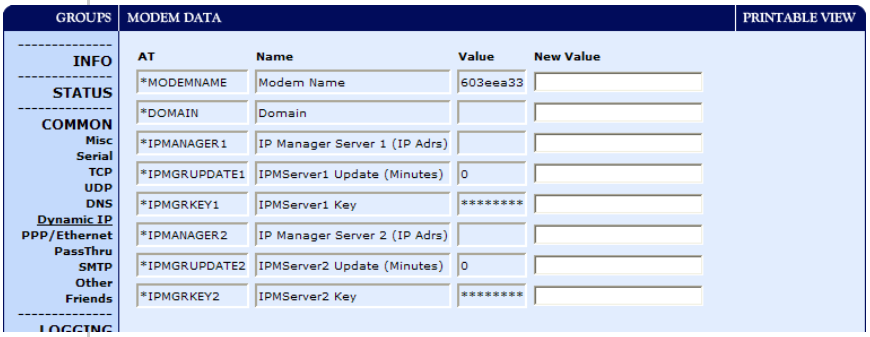


Figure 2-2: AceManager : Dynamic IP

Tip: *The name you choose will not affect the connection but may need to be configured in PPPoE settings for the router, device or computer you will be connecting to your PinPoint X.*

3. Write the configured settings to your PinPoint X

a. Click the *Write* button on the tool bar of AceManager and wait for the message "Write Successful" to appear in the status bar.

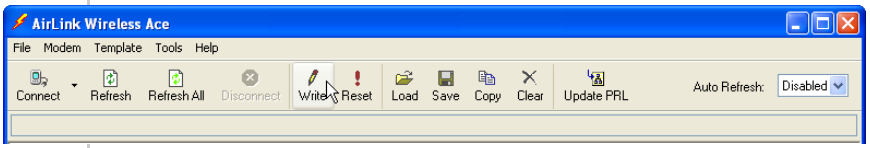


Figure 2-3: AceManager : Write

b. Press the modem *Reset* button on the front of the modem. Wait until the Network indicator is lit and the modem has once again registered on the network.

Configuring a PPPoE Connection in Windows

1. Create a new network connection

a. Select *Start* > *Connect To* > *Show All Connections*. This will open the Network Connections window.

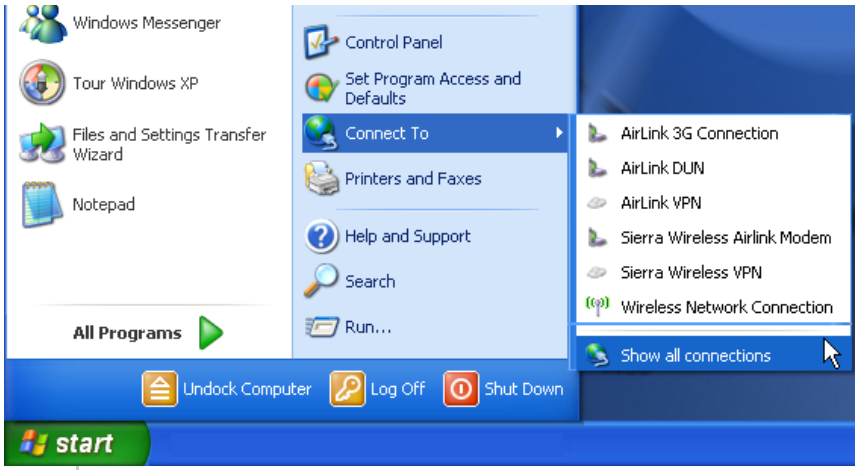


Figure 2-4: Windows : Start menu

b. Select *Create a New Connection* under Network Tasks in the menu area on the left. Select Next to start installing and configuring the PPPoE connection.

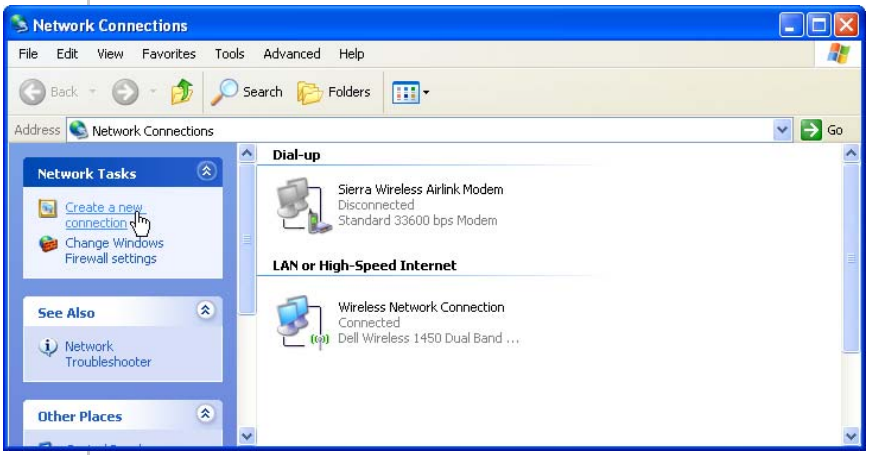


Figure 2-5: Windows : Network Connections

c. Click *Next* on the opening screen to begin creating a PPPoE connection.

d. *Next*.

Figure 2-6: New Connection Wizard

e. Select *Connect to the Internet*.

f. Select *Next*.

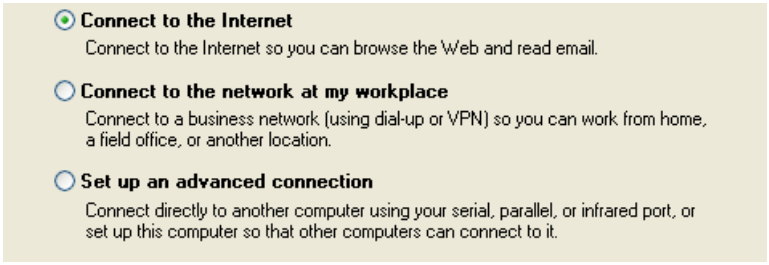


Figure 2-7: New Connection: Type

g. Select *Set up my connection manually.*

h. Select *Next*.

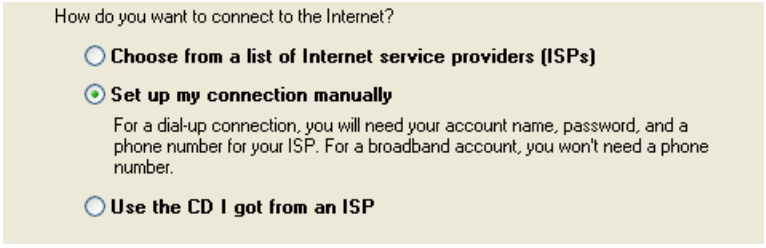


Figure 2-8: New Connection: How do you want to connect?

i. Select *Connect using a broadband connection*.

j. Select *Next*.

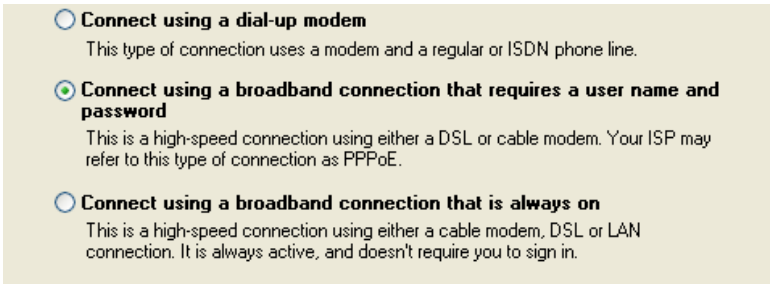


Figure 2-9: New Connection : Connect using broadband

k. Type in a name for the connection, such as *Sierra Wireless AirLink Modem*.

l. Select *Next*.

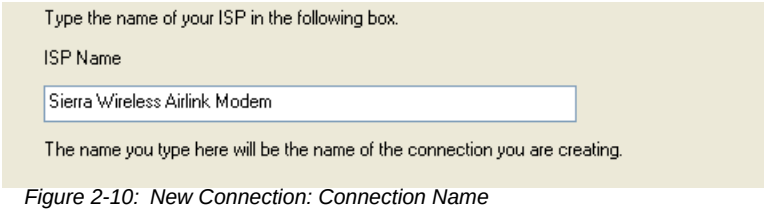


Figure 2-10: New Connection: Connection Name

Tip: *The name provided here will not effect the connection in any way. It is only a label for the icon. It can be the name of your wireless service provider (Provider), your modem (PinPoint X), or any other designation for the connection.*

m. *Optional:* If you have multiple users configured for your computer, you may be prompted for Connection Availability. If you select *My use only,* the account currently logged on will be the only one able to use this connection.

n. Enter the user name and password you configured for *HOSTUID and *HOSTPW above.

Tip: *If you want to allow others to use the same login for the modem, select Use this account name and password... Select Next to continue.*

o. Select *Next.*

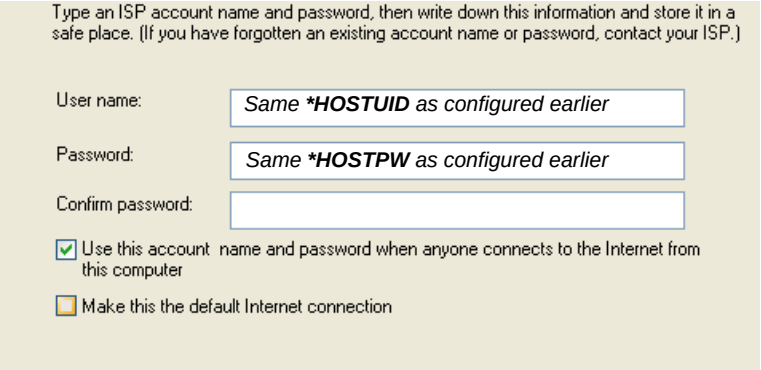


Figure 2-11: New Connection: Connection Information

Caution: *If you have a LAN connection to the Internet and select Make this the default Internet Connection for the PPPoE configuration, you will not be able to use the LAN to connect to the Internet and may also affect the network connection on your computer to the rest of the LAN. Select this option ONLY if the PinPoint X will be your sole network connection.*

p. If you want to add a shortcut for this PPPoE connection to your desktop, check Add a shortcut...

q. Select *Finish* to exit the Network Connection Wizard.

Figure 2-12: New Connection: Finish

2. Configure the PPPoE connection

After you complete the New Connection Wizard, there are a few more things you will want to configure in the connection.

a. Select *Properties*.

Figure 2-13: PPPoE Connection

b. *Optional:* On the General tab, if you gave the modem a name with *MODEMNAME above, you can type in that name as the Service Name.

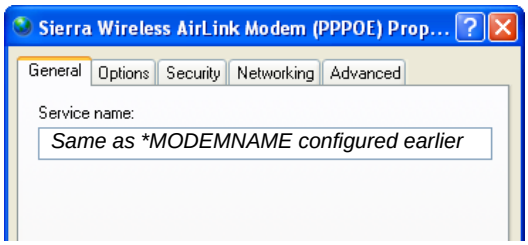


Figure 2-14: PPPoE Connection : Service Name

c. Select *Networking*.

d. Select *Settings*.

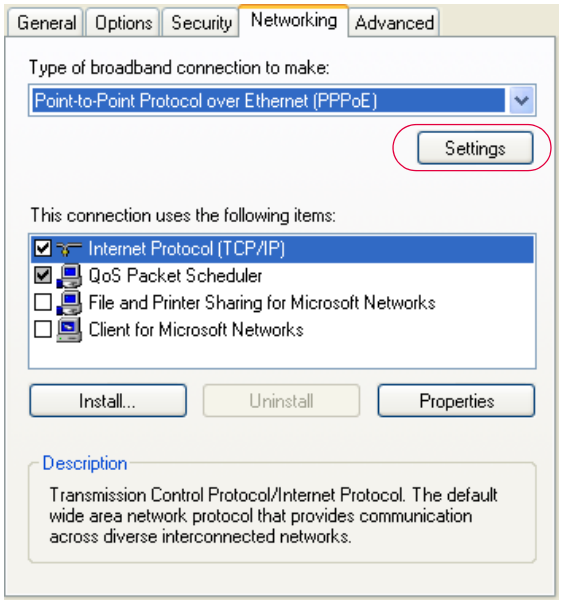


Figure 2-15: PPPoE : Networking

e. Remove the checks from all three PPP settings.

f. Select *OK*.

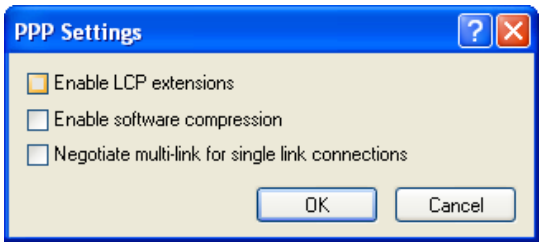


Figure 2-16: PPP Settings

Tip: *You may want to check the Options tab and change the settings for applications you might be using. The default options are generally applicable for most uses.*

Caution: *Unless specifically directed to do so by Support or your network administrator, you do not need to make any changes to the options on the Security tab.*

g. Select *OK* until you return to the *Connect* window.

Connecting to the Internet with PPPoE

Now the PPPoE connection can be run and a data connection can be established.

a. Connect your computer and the modem to the same local network using a hub or a switch.

Note: It is not recommended to connect your computer directly to the modem without a hub or switch.

b. Start the PPPoE by *Start* > *Connect To* > *Sierra Wireless AirLink Modem* (or whatever you named the connection). It will be listed on your Network Connections window under the heading Broadband.

Figure 2-17: PPPoE Connection

c. Enter the User name and Password you configured for *HOSTUID and *HOSTPW earlier.

d. Select *Connect* to connect to the modem and the Internet.

When you're connected, an icon should appear in the System Tray, near the time display, showing the connection status.

C: Windows Dial-up Networking (DUN)

C

- Installing a modem driver for PinPoint X
- Creating a Dial-Up Networking (PPP) Connection
- Connecting to the Internet Using DUN

Dial-up Networking (DUN) allows a computer or other device to use the serial port or USB virtual serial port on your PinPoint X to connect to the Internet or private network using PPP just like an analog modem using a standard phone line.

Caution: *To install any driver on your computer, you may need to be logged in as Administrator or have Administrator privileges for your login.*

Microsoft Windows XP is used in the examples below. The modem driver installation and DUN setup and configuration is similar in Microsoft Windows products. Examples are not provided here for installing the driver or configuring DUN for any other operating system.

Installing a modem driver for PinPoint X

Standard installations of Microsoft Windows XP and 2000 include a generic modem driver which will work with your PinPoint X.

1. Connect the PinPoint X.

a. Connect the modem to the computer with a DB-9 cable or the USB port in serial mode. .

b. Plug in the AC adapter, connect the antenna(s) and power on the modem.

2. Install the driver.

a. Select *Start* > *Control Panel* > *Phone and Modem Options* (in Classic View).

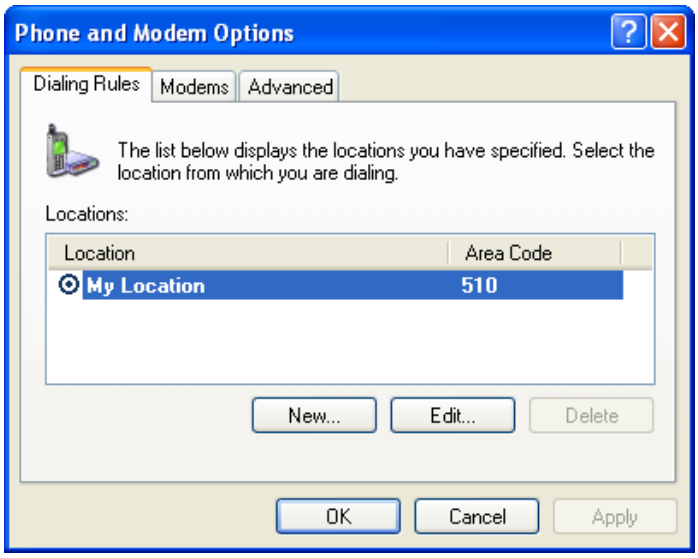


Figure 3-1: Phone and Modem Options

b. Select the *Modems* tab.

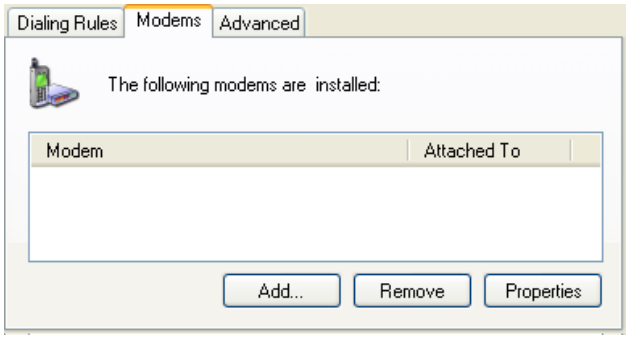


Figure 3-2: Phone and Modem Options: Modems

c. Select *Add*.

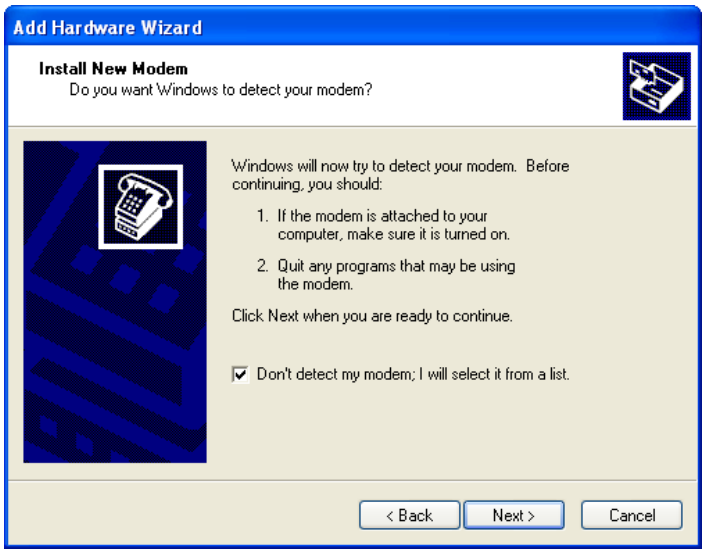


Figure 3-3: Add Hardware Wizard

d. Check *Don't detect my modem; I will select it from a list*.

e. Select *Next*.

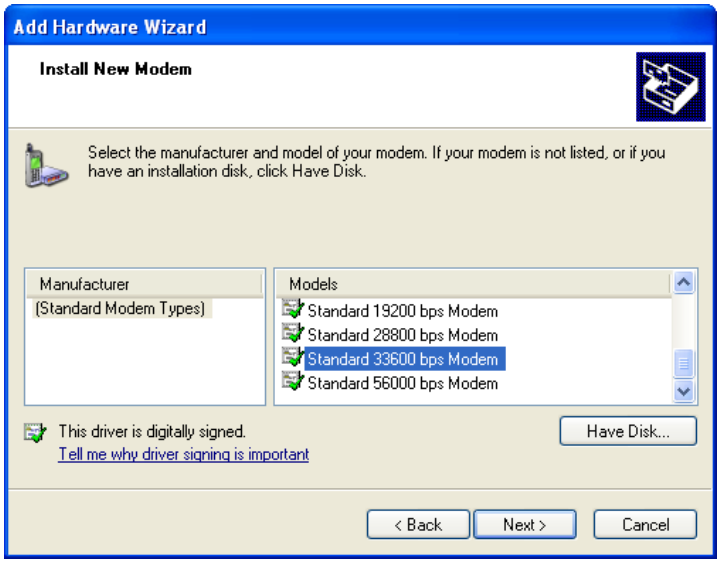


Figure 3-4: Add Hardware Wizard: Install New Modem

f. Select *(Standard Modem Types)* from the Manufacturers column.

g. Select *Standard 33600 bps Modem* from the Models column.

Tip: *If you have the speed for your modem configured as something other than the default, use the Standard Modem that matches the speed you configured.*

h. Select *Next*.

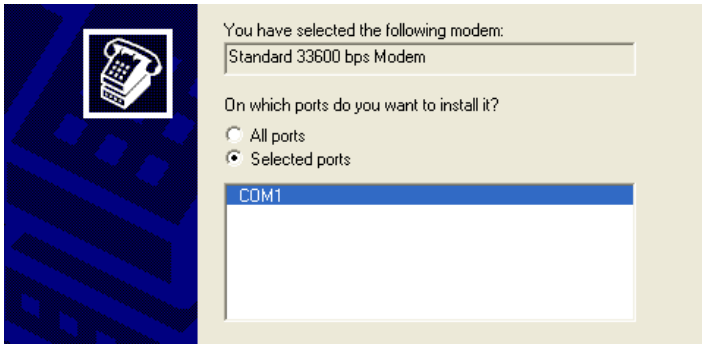


Figure 3-5: Add Hardware Wizard: Select Ports

i. Check *Selected Ports*

j. Select the COM port the modem is connected to (commonly COM1).

k. Select *Next*.

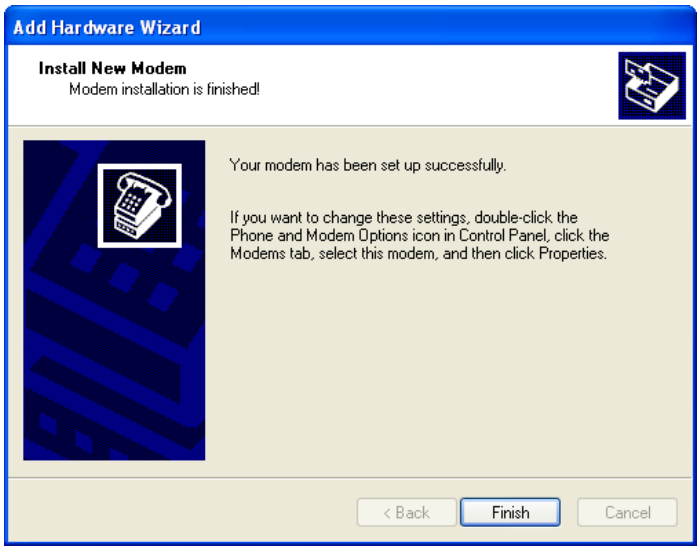


Figure 3-6: Add Hardware Wizard: Finish

l. Once the modem driver is installed, select *Finish*.

3. Configure the driver.

When you return to the *Phone and Modem Options* window, you should see the newly installed modem "attached to" the correct COM port.

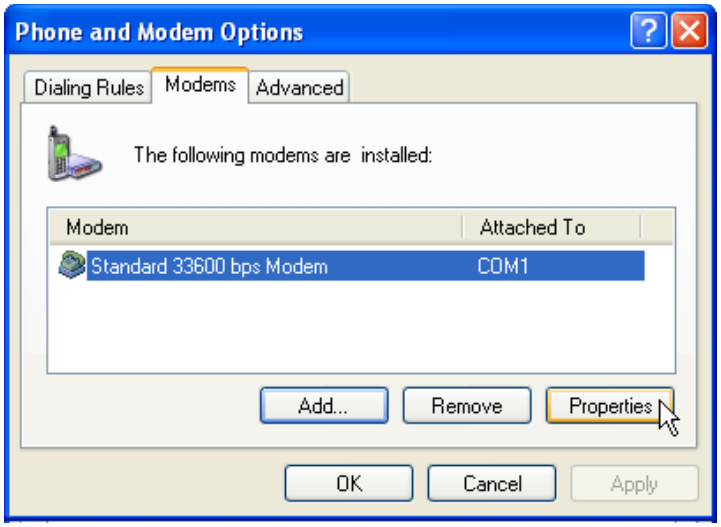


Figure 3-7: Phone and Modem Options: Modems

a. Highlight the modem and select *Properties*.

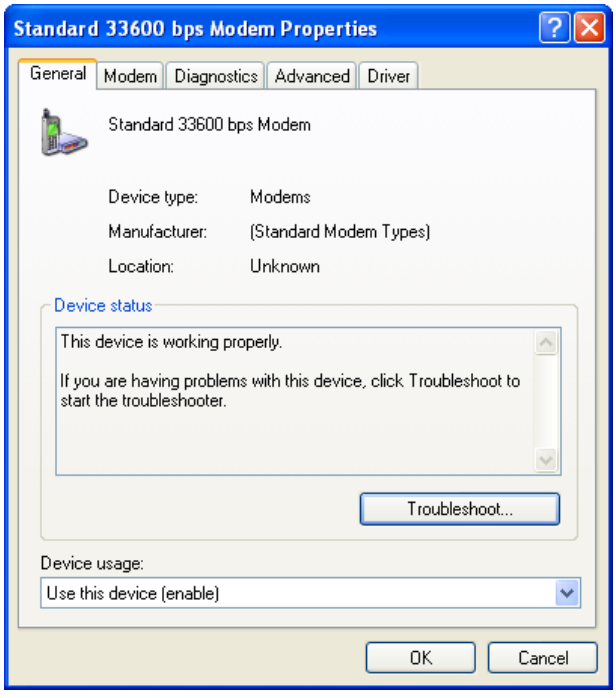


Figure 3-8: Modem Properties

b. Select the *Modem* tab.

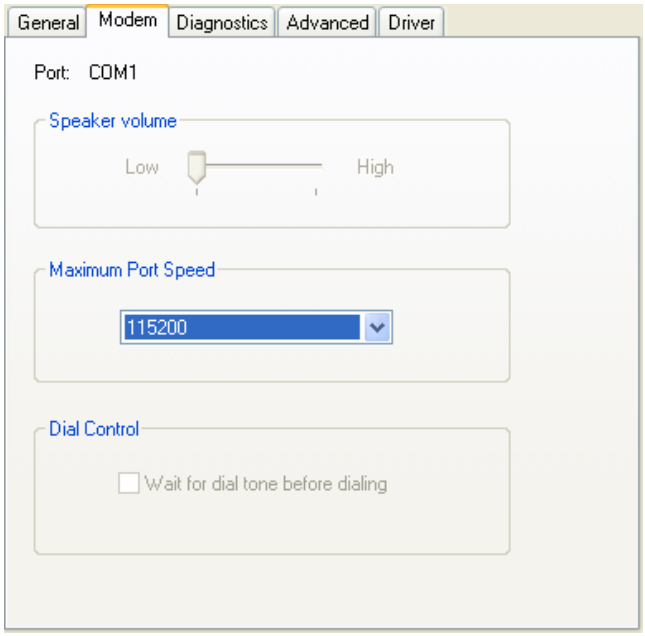


Figure 3-9: Modem Properties: Modem

c. Maximum Port Speed should be set to *115200* (default).

d. Select *OK* to exit.

e. Select *OK* again to exit out of the Phone and Modem Options.

Creating a Dial-Up Networking (PPP) Connection

Once you have the driver for the modem installed on your computer, you can set up and configure Dial Up Networking (DUN) to use the modem as your connection to the Internet using PPP.

Note: No other device or program can be using the same COM port (serial port) configured for the modem driver.

Caution: *If you have an existing LAN connection, installing DUN for the modem may interfere with the LAN connection. It's recommended to disconnect your LAN connection before using a PPP connection with your PinPoint X.*

Once the DUN connection is initiated, by default, it will take over as the "default route" for network communication and specifically for Internet access. If you want the two connections to co-exist, you will need to de-select "Use default gateway on remote network" (described later) and use the route command in Windows to setup routing through the modem properly. This guide does not provide information on the route command. You may need to consult with your network administrator to properly configure routing.

1. Create a new network connection.

a. Select *Start* > *Connect To* > *Show All Connections* to open the Network Connections window.

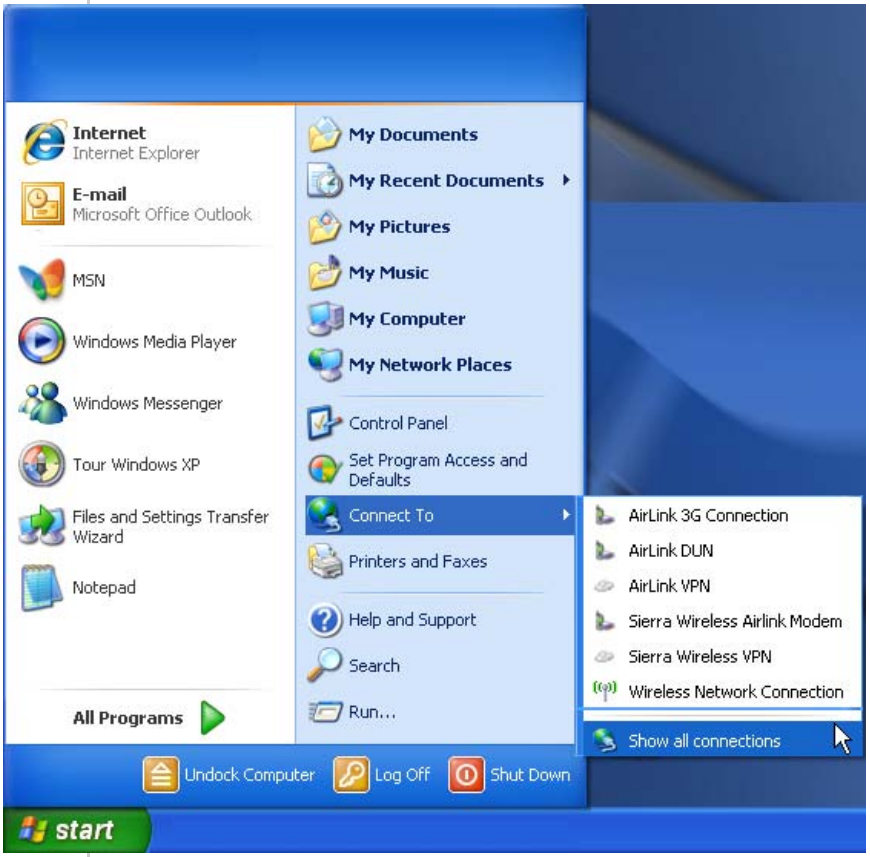


Figure 3-10: Windows : Start menu

b. Select *Create a New Connection* under Network Tasks in the menu area on the left.

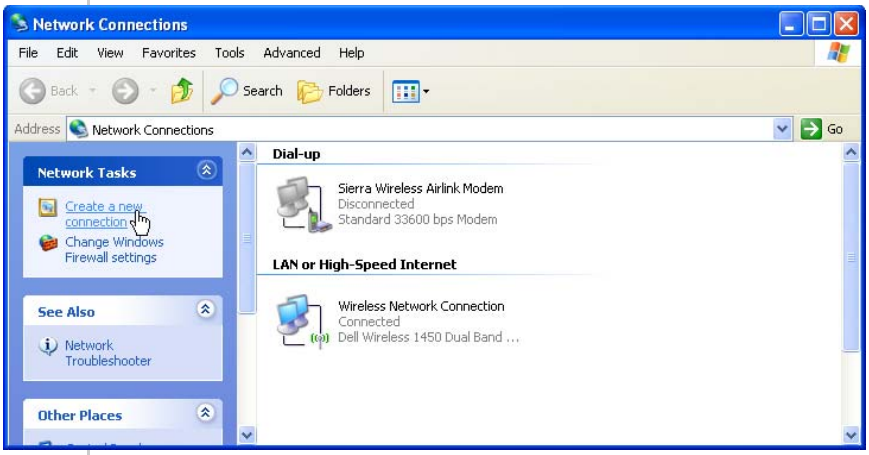


Figure 3-11: Create New Connection

c. Select *Next* to start installing and configuring the DUN connection.

Figure 3-12: New Connection Wizard

d. Select *Connect to the Internet*.

e. Select *Next*.

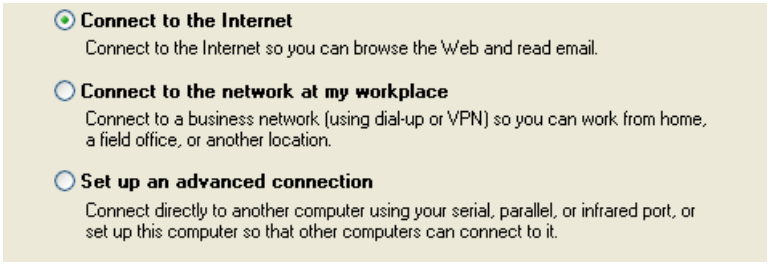


Figure 3-13: New Connection: Type

f. Select *Set up my connection manually.*

g. Select *Next*.

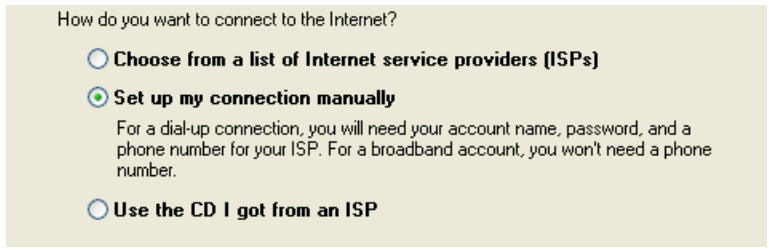


Figure 3-14: New Connection: How do you want to connect?

h. Select *Connect using a dial-up modem*.

i. Select *Next*.

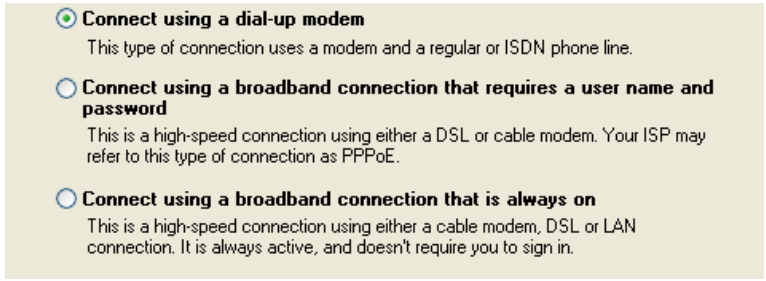


Figure 3-15: New Connection: Connect using...

j. *Optional:* If you have multiple modems installed on your computer, you may be prompted to select the modem to be used. If you only have one modem installed, this option will be omitted.

k. Check *Standard 33600 bps Modem*.

l. Select *Next*.

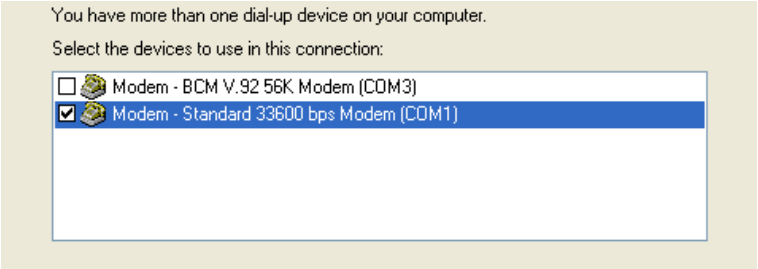


Figure 3-16: New Connection: Select Modem

m. Type in a name for the connection, such as *Sierra Wireless AirLink Modem*.

n. Select *Next*.

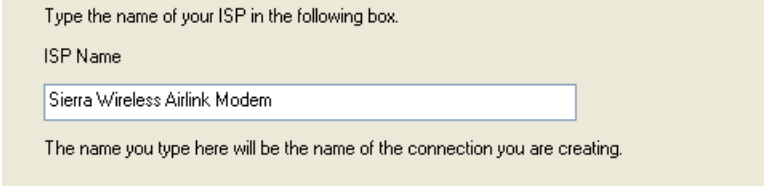


Figure 3-17: New Connection: Connection Name

Tip: *The name provided here will not effect the connection in any way. It is only a label for the icon. It can be the name of your wireless service provider (Provider), your modem (PinPoint X), or any other designation for the connection.*

o. Type in *10001* as the phone number for the modem to dial.

p. Select *Next*.

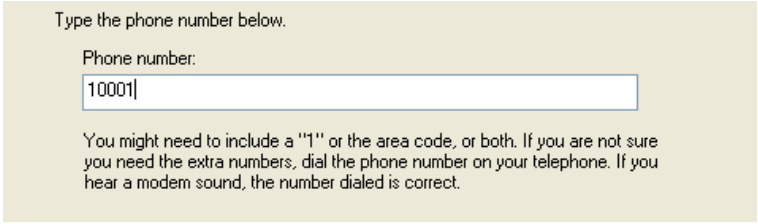


Figure 3-18: New Connection: Phone Number

q. *Optional:* If you have multiple users configured for your computer, you may be prompted for Connection Availability. If you select *My use only,* the account currently logged on will be the only one able to use this DUN connection.

r. Select *Next*.

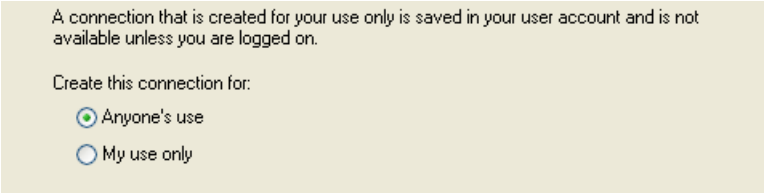


Figure 3-19: New Connection: Permissions

Generally the modem takes care of the Account Information, User name and Password, for the connection, so you can leave the fields blank (unless otherwise instructed by Support).

s. If you want to allow others to use the same login for the modem, select *Use this account name and password....*

t. Select *Next.*

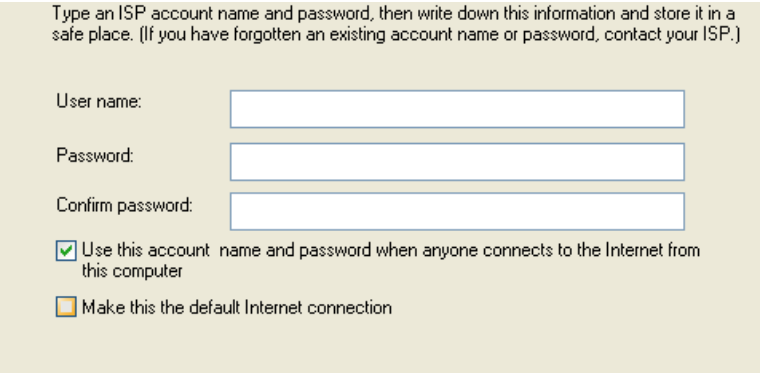


Figure 3-20: New Connection: Connection Information

Caution: *If you have a LAN connection to the Internet and select Make this the default Internet Connection for the DUN configuration, you will not be able to use the LAN to connect to the Internet and may also affect the network connection on your computer to the rest of the LAN. Select this option ONLY if the PinPoint X will be your sole network connection.*

u. If you want to add a shortcut for this DUN connection to your desktop, check *Add a shortcut*.

v. Select *Finish* to exit the Network Connection Wizard.

Figure 3-21: New Connection: Finish

2. Configure the DUN connection

After you complete the New Connection Wizard, there are a few more things you will want to configure in the connection.

a. Select *Properties*.

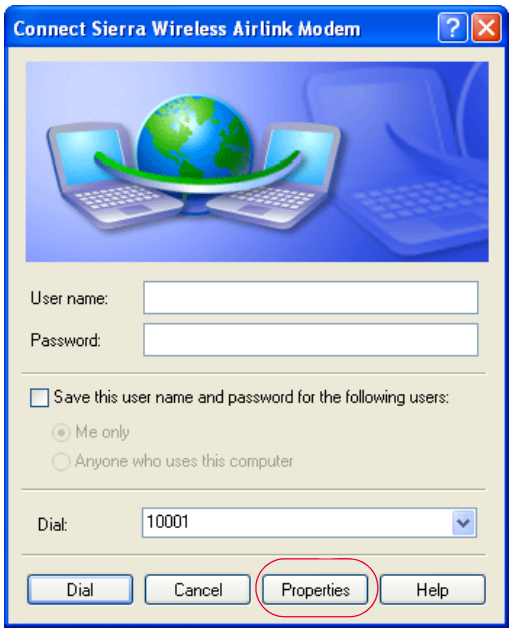


Figure 3-22: DUN Connection

b. Uncheck *Use dialing rules*.

c. Check *Show icon...when connected*.

d. Select *Configure*, below the Connect using line.

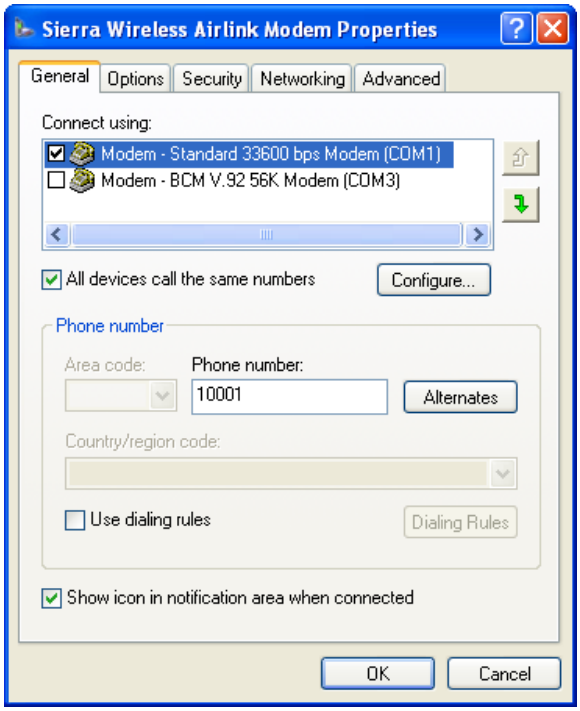


Figure 3-23: DUN Properties

e. Select *115200* as the Maximum speed.

f. Check *Enable hardware flow control*.

g. Do not check any other option.

h. Select *OK*.

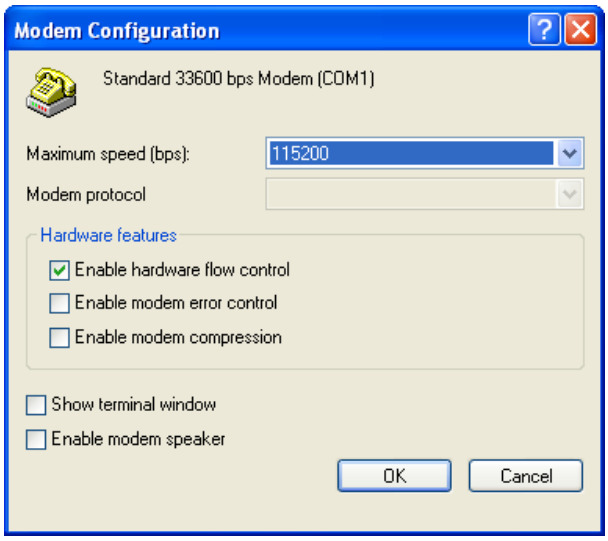


Figure 3-24: Modem Configuration

i. Back at the main properties screen, select the *Networking* tab.

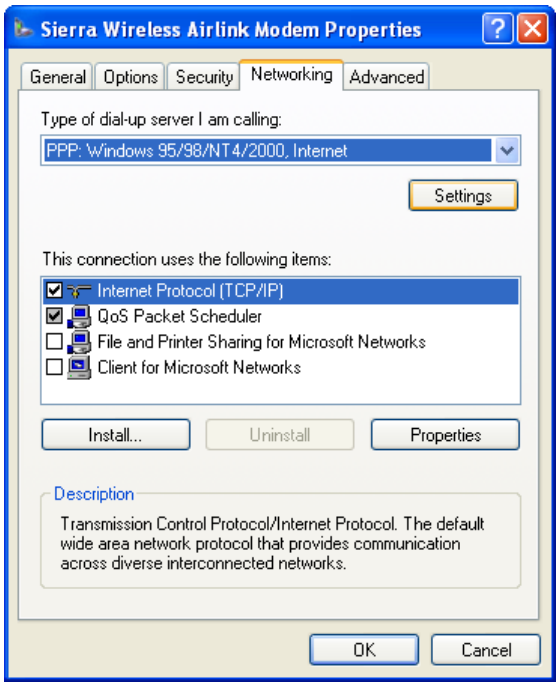


Figure 3-25: Networking

j. Select *Settings*.

k. Remove the checks from all three PPP settings.

l. Select *OK*.

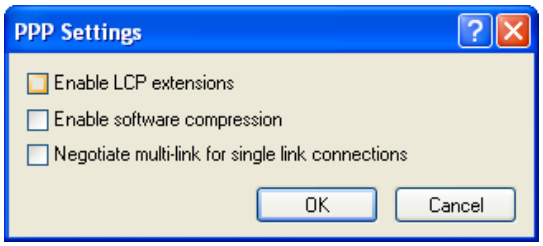


Figure 3-26: PPP Settings

m. Select (highlight) Internet Protocol (TCP/IP) and then select *Properties*.

Tip: *For most configurations, you will be obtaining the IP address and the DNS server address automatically.*

n. Select *Advanced*.

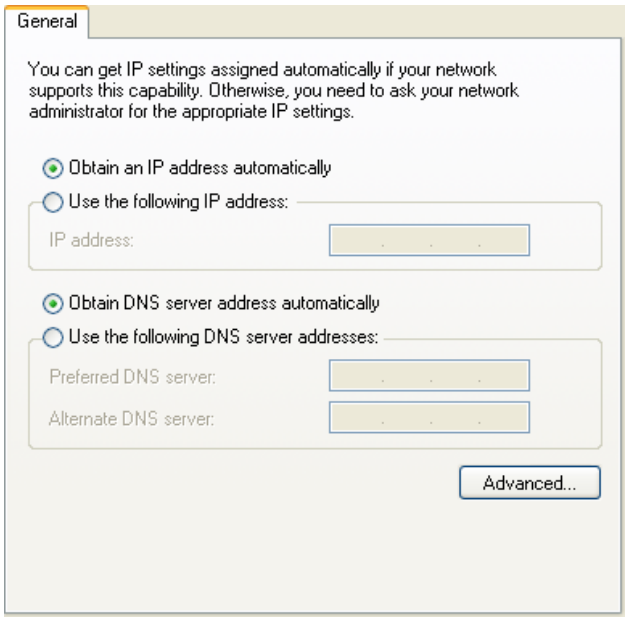


Figure 3-27: TCP/IP Properties

o. Uncheck *Use IP header compression*.

p. Check *Use default gateway on remote network.*

q. Select *OK*.

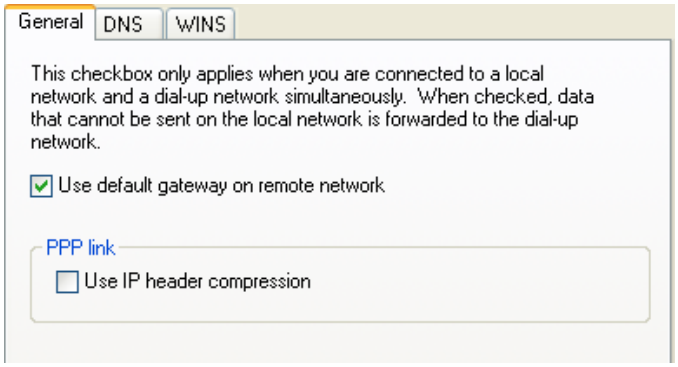


Figure 3-28: Advanced TCP/IP

Tip: *You may want to check the Options tab and change the settings for applications you might be using. The default options are generally applicable for most uses.*

Caution: *Unless specifically directed to do so by Support or your network administrator, you do not need to make any changes to the options on the Security tab.*

r. Select *OK* until you return to the *Connect* window.

Connecting to the Internet Using DUN

There are two methods you can use to connect with PinPoint X to the Internet using DUN, AceView and the Windows DUN connection directly.

AceView

AceView is a small utility which can maintain your DUN connection and monitor the connection of your PinPoint X to Provider. If you have not already installed AceView you can obtain the most recent version from the Sierra Wireless Airlink website.

Note: The direct DUN connection features of AceView are not available in Windows 98 or Windows NT.

This guide assumes you have a default installation of AceView.

1. Start AceView.

Start > All Programs > AirLink Communications > AceView

2. Enable the Connection.

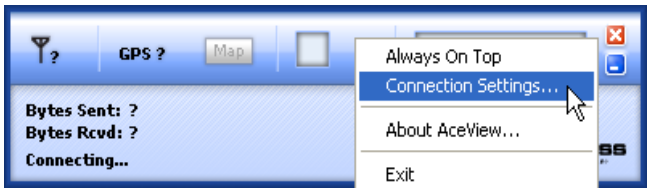


Figure 3-29: AceView: Menu

a. Right-click on the AceView window to open the menu.

b. Select *Connection Settings*.

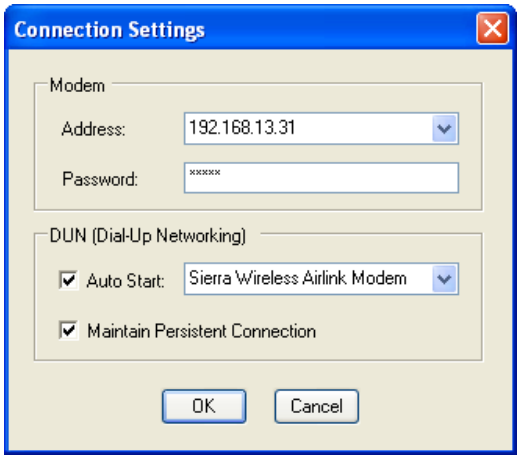


Figure 3-30: AceView: Connection Settings

c. Select *Auto Start* in the DUN section.

d. Select *Maintain Persistent Connection*.

When checked, AceView will continually check the DUN connection to ensure it is not down. If so, AceView will attempt to connect again.

Tip: *When using the DUN connection, make sure the IP Address is set to the local IP address of the modem, 192.168.13.31 by default.*

e. Select *OK*.

f. *OK*.

Windows DUN

You can directly use the Dial-up link for the DUN connection.

1. Start the DUN session.

Start > Connect To > Sierra Wireless Airlink Modem

If you named the connection differently, use the name of the PPP connection you made earlier.

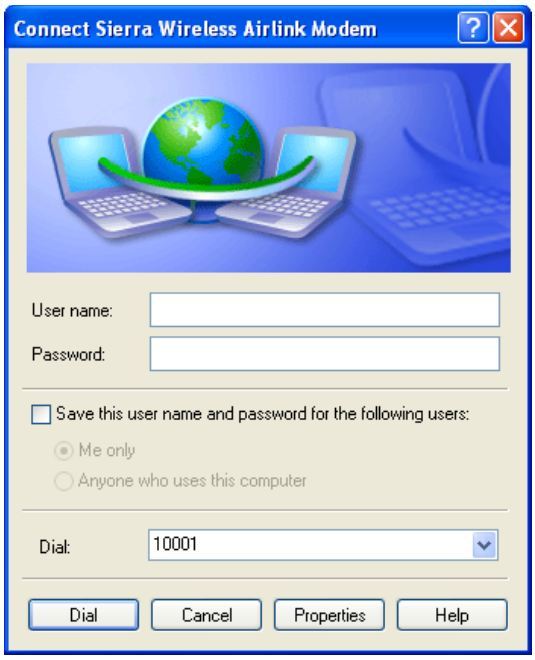


Figure 3-31: DUN Connection

Tip: *Generally you will not need to enter a Username or Password. If you do need to enter either, you can enter these parameters beforehand using *NETUID and *NETPW.*

2. Select Dial to connect to the modem and the cellular network.

When you're connected, an icon should appear in the system tray showing the connection status.

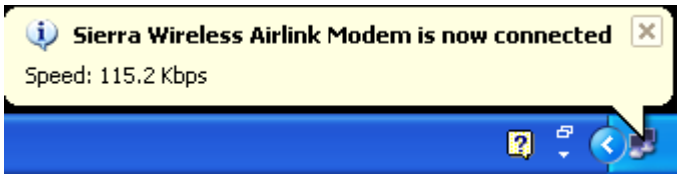


Figure 3-32: Connection indicator

Note: The speed shown in the connection is the speed between the modem and your computer, it is not the speed of the modem's connection to Provider or the Internet.

Caution: *For DUN connections on a Windows Mobility or other non-personal computer, the DNS settings may not be configured with the DUN connection. You may need to go into the network settings and add DNS servers manually.*